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Pure Air and Purified Water: New Light on the Solution of the Sewage Problem.

THE most advanced science of the Middle Ages regarded all things as ultimately referrible to "the four elements." Fire, air, earth, and water were considered to be original entities or principles, and the visible species of the material world were regarded as partaking of fiery, airy, earthy, and watery mixtures. The classification was not confined to the surface of our planet: it was extended to embrace the heavenly bodies. The signs of the zodiac were divided into tetrarchies or tetramenies, the fiery, airy, earthy, and watery signs being always in trine aspect to one another, that is to say, four signs apart; and the planets themselves are spoken of as earthy or fiery, cold or moist.

The discoveries of Dalton and of Cavendish opened the door to a very different appreciation of the elements of chemistry. But some of the old associations yet linger. Above all we are accustomed to speak of the air as something everywhere present, and everywhere the same, "the air we breathe, without it we die."

We are, however, now aware that very great changes have taken place in the composition of the atmosphere, long since our planet was the abode of animal life. As to whether permanent change is still going on, we have no data on which to form an opinion; we can, however, conclude that the waters of the ocean are gradually becoming more salt. We know that in those cases (of which the Dead Sea is the most conspicuous example) in which rivers run into a basin from which the only escape is by means of evaporation, the water continually grows salter. A change of the same kind, however slow, must be occurring in the ocean, to which the rivers are constantly contributing the salts that they wash from their beds.

The effects of storm, tempest, and rain tend to maintain the general unity of condition of the atmosphere. But apart from that difference which is appreciable to the senses, in what we call the change of air from spot to spot, which is more probably telluric than atmospheric in its origin, very great differences exist in the hygrometric character of the air, in different localities, as well as at different seasons. Again, the atmosphere is at times locally loaded with smoke, with miasmata, and with the products of the respiration of animal and of vegetable life; and where masses of men are congregated, as in our great cities, and where walls and barriers prevent the free circulation of air,—above all, in badly-ventilated apartments,—the loading or vitiation of the atmosphere may proceed to such an extent as to make it unfit to support life. We must remember that it was not until chemical analysis had been carried to a high degree of delicacy that it became possible to ascertain either the quality or the quantity of the foreign elements mingled with a vitiated atmosphere. The most subtle test, after all, is afforded by the human lungs; and we know that so slight a change as that of the diminution from 2,096 parts out of 10,000, to 2,075 parts, in the oxygen of the atmosphere, that is to say, of 21 ten-thousandth parts, when the place is supplied by carbonic acid and animal exhalations, is most perceptibly injurious to respiration.

It is thus evident that there is a close connexion between such a subject, which we may call primarily one of an architectural order, as the ventilation of halls and buildings, and the poisoning by carbonic vapours, and by coal gas, and again as the practical manufacture of oxygen. These three subjects of study have been recently illustrated respectively in a French, a German, and an American scientific journal, and brief abstracts of the three papers in question will be found in the recently-issued sixty-fifth volume of the "Minutes of Proceedings of the Institution of Civil Engineers."

That the supply of oxygen gas, whether in that form, or in the state of ozone, is one of the most efficient, perhaps the most efficient, means of restoring the purity of the atmosphere, we think is indisputable. We see the effect of a powerful dose of oxygen in the case of the application of the liquid known as Condy's disinfecting fluid, the action of which on tainted water or sewage is so direct and certain. In fact, for purifying water from organic pollution, the supply of oxygen may be regarded as the one specific. This is the secret of the action of gravel or sand in purification of polluted water. Oxygen is admitted into direct contact with the particles of foreign matter in percolation, and, in point of fact, consumes them. So it is if oxygen is thrown into the polluted fluid chemically, as by means of the fluid we have named. The action of the oxygen is the same, whether it be mechanically or chemically supplied. But supply of oxygen to a vitiated atmosphere has been hitherto less studied than its application to polluted water.

The question of cost of production has stood much in the way of the utilisation of oxygen for sanitary purposes. M. E. Guitton, who is the inventor of a new process for the production of oxygen, contemplates the manufacture of his gas at the price of half a franc per cubic mètre and less in large quantities. This is just one per cent. of the price which the French theatres now pay for a supply of the gas. A cubic mètre contains 35·35 English cubic feet. Thus, ordinary coal-gas, at 3s. 3d. per 1,000 cubic feet, costs about 1½d. per cubic mètre; so that M. Guitton proposes to reduce oxygen to less than the price of coal-gas. It is evident that, if this can be done, an immense step will have been taken in the progress of sanitary application.

It has long been known that barytes possesses the power of absorbing oxygen from the atmosphere at a certain temperature, and giving it out again at a higher temperature. But the practical difficulty that has hitherto interfered with the utilisation of this property is, that after a certain number of repetitions of the process (about ten) the material used becomes inert, and incapable of continuing the same operation. The improvements introduced into the process by M. Guitton consist in (1) the preparation of the air, by the removal of carbonic acid and the supply of moisture, in order to render it easily decomposable by the barytes; (2) the use of pumps or fans to facilitate the peroxidation of the barytes; (3) the employment of a vacuum, or exhauster, for the extraction of the oxygen from the oxidised barytes; (4) the application of great heat, under the guidance furnished, by a special pyrometer; and (5) the preparation of the barytes itself.

The process is now being carried on at Passy. With an average of ten charges per day, forty cubic mètres of oxygen are obtained from 100 kilogrammes of barytes. The gas obtained was 95 per cent. pure oxygen. The 5 per cent. remainder was nitrogen, probably furnished by the atmosphere, owing to some defects in the apparatus. The cost was 0·619 franc per cubic mètre; but with increased production it is estimated that it can be reduced to 0·127 franc per cubic mètre, or 3½d. per 1,000 cubic feet. Oxygen made from chlorate of potash and bin-oxide of manganese costs 12 francs per cubic mètre.

The uses to which an economic supply of oxygen can be advantageously put are many. If it be applied to the combustion of charcoal, or of mineral oil, a splendid light is produced, at about one-third the cost of Paris gas. As to its application to the purification of the atmosphere, whether of rooms or of streets, we have to await experiment. But it is, in our opinion, a matter deserving the most serious attention to consider how far the boon which the talent of M. Guitton has supplied to industrial chemistry may lead to a solution of the most pressing and most perplexed of the sanitary questions of the day.

Of that foul and noxious flood which the Metropolitan Board of Works are now constantly pouring into the Thames, the poisonous and useless element is the organic matter, in various states of decomposition. Of the solid and liquid elements of sewage, apart from the water used as a carrier, the organic portion forms respectively 4·62 and 4·15 per cent., in weight. The ordinary dilution (exclusive of that by storm-water) is from 90 to 100 to 1. Thus out of 10,000 parts of weight of ordinary sewage, the poisonous element may be taken as 4½ parts. If this be removed or destroyed, the other foreign matters, mineral and gaseous, are not only unprejudicial, but have a chemical value of something over 4s. per unit of population per annum.

And the sewage utilisation problem is, how to extract this fertilising matter at a less cost than its agricultural value.

So serious has every experimenter found the cost of such extraction to be, that the idea of sewage utilisation, except under very favourable conditions, is gradually losing supporters; and it is indeed felt that the endeavour to secure a commercial value has greatly interfered with the progress that might otherwise have been made in the more urgent requisite of disinfection. For a considerable time our own opinion has been more and more steadily pointing to the conclusion that precipitation, filtration, and actual combustion of the solid deposit of sewage would have to be resorted to sooner or later. And as to this, the fact that the poisonous organic matter is itself combustible has led us to consider how far dried sewage may be made to consume itself, with but little extra fuel.

But if it be possible to drive through a volume of sewage a current of oxygen gas, the combustion of the organic matter will be effected in the most ready and complete manner. In point of fact, if a sufficient quantity of Condy's fluid were mixed with a stream of sewage, the results would be admirable. The barrier, of course, is the expense. The possibility of supplying pure oxygen is therefore to be regarded, not so much mechanically as financially.

Here there comes in the question, if oxygen can be supplied at less than the price of ordinary coal gas, does it not afford us what we require? Under any circumstances, it is the combustion of the organic matter which is the great aim we have in view. Is it likely that this organic matter, when once it has been collected in great unmanageable reservoirs, can be more cheaply destroyed in any other way than by admitting to it as it exists in solution or mixture in the sewage the dose of oxygen necessary for its combustion?

As to the cost, it is, no doubt, considerable. But the point to consider is,—can the object be attained by any cheaper method? That we shall long go on polluting the Thames without stint we do not conceive to be possible. The nuisance is becoming intolerable, and pestilence will follow if it is not abated.

Ordinary albuminous matter requires about nine times its own weight of oxygen to consume the hydrogen and carbon which it contains. In 10,000 gallons, or 100,000 lb. of ordinary sewage, there is, as we have seen, about 45 lb. of organic matter. To consume this is requisite 400 lb. of oxygen. Now, 11·89 cubic feet of oxygen weigh 1 lb., so that 4,760 cubic feet of this gas will be required to consume the organic matter in the 100,000 lb. of sewage. The cost of the gas, on M. Guitton's showing, will be about 13s. 6d. The 10,000 gallons of sewage may be taken as roughly equal to the proportion per unit of population; and the chemical value of the mineral elements of the sewage has been some time back estimated at 4s. 8½d. per unit of population. Thus if the actually poisonous matter be destroyed by the admixture of oxygen, the mineral elements will remain in a condition in which they may be dealt with without danger and without disgust, and at least a third of the cost of the process may be recovered from its results.

This is not so brilliant an outcome as has been often anticipated. But the question is, can anything be substituted which is cheaper, and equally likely to be effective? We desire to put forward the suggestion with all reserve. It is one which demands not only reflection, but experiment, in order to determine its value. But we confess that a great reduction in the price at which oxygen can be produced seems to us, at all events, to cast a ray of light in the direction in which we have been for some time straining our eyes. It is this ray that seems to us to emerge from the process of M. Guitton. We may be wrong. We may be too sanguine. But we feel convinced that the idea is one which should not be either scouted or neglected. It would, no doubt, require sustained experiment on a considerable scale to ascertain how much more than the quantity of oxygen that on paper would be fully equivalent to the combustion of all the organic matter in a given volume of sewage would be practically necessary in order thoroughly to purify that volume. The bit of experience which is most conclusive in our minds is the magical action of the fluid we have mentioned, which is much too costly for use on a large scale. But we call the attention of those of our readers who, like ourselves, have been long studying this great problem of civilisation, with good hope of some wholly unexpected solution. And we invite the ingenious author of the process (whom we only know from the pages of the "Resumé de la Société des Ingénieurs Civils," and from the "Minutes of Proceedings of the Institution of Civil Engineers"), to add any contribution that his own experience can suggest to our attempt at a fresh step towards a definitive solution of perhaps the most vexed problem of civilisation.

THE SOCIAL SCIENCE CONGRESS.

It is to be hoped that the attractions of Irish hospitality, as well as the more serious interest attaching to everything connected with that part of the Kingdom at present, will avail to counterbalance the disadvantage of the rather long journey which London members will have to take for this year's congress. It has generally been found that the attendance of the London contingent of the members is inversely in proportion to the distance to be traversed, a consideration which, we believe, operated against the attendance last year at Edinburgh. It may be said, however, that the capital of Ireland seems at present a very appropriate and suggestive quarter in which to discuss the graver problems of social relations, and we have reason to suppose that the brief and comprehensive theory of the relative positions of England and Ireland which was formulated by Moore,—

> "On our side is virtue and Erin,
> On theirs is the Saxon and guilt,"—

is not accepted by the Dublin promoters of the Congress as an accurate representation of the position. The long list of names in the local committees seems to indicate a considerable interest in the matter, at all events in the Irish capital.

The special questions in the legal and educational departments seem to be of serious import and of more than usual interest; on these we are not called upon to comment. But we cannot look without special interest at the announcement of the first question to be considered in the Economy and Trade Department, as to the results that may be expected to arise from the extension of the system of participation by labour in the profits of manufacturing, agricultural, and trading enterprises. We have long approved this system and desired its extension, and have often recommended it, notwithstanding what has been said as to failures, as the most promising solution of the problems arising from the at present conflicting interests of employers and employed, and we cannot but hope that some decided stimulus to the further extension and adoption of the system may result from the discussion of the question at Dublin,—at all events, that its value and hopefulness as a means of promoting true mutual understanding between labourers and capitalists may be brought home to many who have, perhaps, not duly considered the subject before. The third question in the same department,—What industries could be advantageously developed in Ireland, which from natural causes are specially suitable to the country?—is one of the greatest and most special interest to Ireland at this moment, though we fear we must not be too sanguine in expecting any very large or immediate results from it; still, some suggestion of value may be thrown out, which may bear fruit at a favourable moment.

The special questions for consideration in the Health Department deal entirely with the legal aspects of sanitation; they are not concerned with mechanical means of ensuring healthy conditions, but with the legal means of controlling the population so as to lead them in the paths of righteousness as contemplated from a sanitary point of view. The question whether hospitals should be placed under State supervision, which is the first on the list, is one in regard to which we should feel very doubtful whether any but a qualified assent could be given. The question here, as between the advantages of private and of Government management, suggests somewhat the same kind of *pros* and *cons.* as the question of Government interference with railway management. In regard to the latter, it is believed that the interests of the public are better served by allowing each company to adopt its own manner of working and its own plans of construction than by the Government imposing any uniform system upon all. So with hospitals: we imagine that no persons are so desirous to keep hospitals under the best sanitary conditions as the medical superintendents themselves, and that it would be much more desirable to allow scope for the exercise of individual judgment and for reasonable liberty of experiment than to impose a set of hard-and-fast rules on hospital authorities. Government inspection, if adopted, would be better confined to advising and reporting in the main; though the results of a general survey, extending over some years, by competent Government officials, might be very well and advantageously summed up in a general code of recommendations derived from the total result of this experience. To the third question,—Is any further legislation necessary to more effectually prevent the overcrowding of dwelling-houses?—we imagine a very decided affirmative will probably be returned. It seems certain at least that either the present legislation in itself, or its practical method of operation, is deficient in efficacy to check this evil.

Of the three questions forming the special subjects for discussion in the Art Department, one is of a practical and business character, and the other two are more vague in their objects, and touch more nearly on the ever-vexed question of "taste." The practical subject is that of copyright as regards music, painting, sculpture, and the fine arts generally, considered in relation to the Bill on the subject to be introduced into the House of Commons. We expressed a part of our mind upon the difficulties in connexion with artistic copyright some time since (see *Builder* for February 15th, 1879). The subject is one of the most awkward to deal with in a legal manner, partly on account of the difficulty in defining what constitutes infringement of copyright in regard to a work of art, and also the difficulty of settling what is equitably due both to artist and purchaser. We may call attention to the fact that music, although grouped with arts of design in the heading of the question, in reality does not stand on the same footing, but is under conditions much more nearly allied to those which operate in the case of literature, and might better be treated in that connexion. A printed piece of music is like a printed book; it can be said at once whether it is a piracy or whether it is not; but a design is a more delicate matter. It may be copied so as to get all that is of most value in the idea and execution, and yet so as to evade the charge of actual copying; or it may be reproduced (which is what the artist dreads just as much) in what is intended as a faithful copy, but so clumsily executed as to libel the original work, and injure the repute of the artist with those who have not seen the original. With this chance hanging over him, the artist not unnaturally wishes to prevent any one making copies, save under his own supervision,—a matter which, in the case of works that are accessible for public inspection, is very difficult to accomplish, and the most rigorous laws on the subject may bring him no nearer intercepting the transgressors. The purchaser has his interests also, which are of a more commercial kind, but not on that account any more easily defined and protected by law. The purchaser has paid money for the picture, or statue, or whatever it be, and having done so he can place it in his private house, in his inner chamber if he will, and have the full and uninterrupted enjoyment of it; but he demands more than this: he demands that no one else should have the enjoyment of it,—in other words, that the artist shall not furnish a similar painting or statue to any one else. If the question were argued on artistic grounds only, this attitude would hardly be defensible at all: it would be properly regarded as a selfish and dog-in-the-manger policy; but the subject is complicated by the fact that paintings cost money, and represent, therefore, a money value which the owner may some day wish to realise, or even be compelled by circumstances to endeavour to realise as far as possible, and he has then some reasonable ground of complaint if he discover that, say, three other persons have replicas of the painting, and that one of them obstinately claims that his own is the original, and thereby brings down the value of the real original at a time when its owner is very desirous to realise as much of that value as possible. This seems, perhaps, a very low view to take of the value of a work of art, but the value of works of art has its commercial side, and there can be no question that artists have occasionally very unfairly ignored this fact in their production of replicas; and that, although the question of artistic copyright is of more importance to the artist than

to any one else (since it touches him in repute as well as in pocket,—"who steals my purse, steals trash," &c.), still it has its importance to the purchaser, whose interests ought not to be ignored.

The second special question,—What should be the relations of painting and sculpture to architecture?—seems to involve two questions, that of the province of the architect, and the relation in which he is to stand to the sculptor and painter, whether as overlooking and controlling their additions to the building, or whether merely preparing a frame for them to fill in as they please; and the relation of architecture itself to sculpture and painting, and how far it is to be regarded as a genuine "art" independent of them. The question touches upon some interesting points in regard to the practice of architecture, and of what may be called monumental art generally. The third question, as to the influence of the annual exhibitions of sculpture or painting upon the public taste, appears rather vague, but it is quite possible to treat it so as to lead to some practical results,—at all events in regard to one point (which has been before touched upon in the Art Section), viz., the desirability of some control being exercised over the at present unlimited scope afforded to Royal Academicians to hang anything they please and as long as they please,—a liberty the unchallenged indulgence of which has already led to strange and even ludicrous results in some of the annual Academy Exhibitions, and which we imagine some of the more eminent members of the body would be very glad to see judiciously restricted.

There is, at all events, plenty of scope for discussion in these three subjects in the Art Section; and Sir R. Stewart, the Professor of Music in Trinity College, Dublin, is also to read a paper on musical education, and there will, no doubt, be other subsidiary papers not yet officially announced.*

THE MIDDLESBROUGH JUBILEE.

Commemorative of its commencement, the busy town of Middlesbrough-on-Tees is proposing to celebrate its jubilee. It intends to unveil a statue of Mr. Henry W. Bolckow, one of the chief of its ironmasters in the past, its first mayor, its first member, and the head of that firm which played so great a part in the development of the town. It honours the memory, also, of Mr. John Vaughan, Mr. Bolckow's partner, and of Mr. Joseph Pease, its projector. In the celebration Lord F. Cavendish takes a principal part, and Earl Granville, Sir Thomas Brassey, and other distinguished men, are to be present; whilst, subsidary to the chief feature, there are to be processions and fireworks, electric-light displays, and a banquet for the chief guests. It is slightly over fifty years since the commencement of Middlesbrough, but the delay in the holding of the jubilee enables the day to become also the occasion of the unveiling of the statue, and of the presentation of portraits.

Middlesbrough was projected by the promoters of the first public railway as a port for the shipment of coal, and rather over fifty years ago the first shipment was made. On that foundation the town was commenced, the site at the time of the purchase of the land being at the best agricultural land, and the population under two score. But, under the influence of the directors of the Stockton and Darlington Railway, the young town grew, attracted one or two small manufactures, and at the end of the first decade, after its practical commencement, it had a population of 5,709. In the next decade, the census of 1851 showed an increase only to 7,893, although the iron trade had been introduced in a small way into the town. But the supplies of ironstone in some of the lead and coal mining districts of Durham had given out, and as the demand for iron increased with the development of the railway system, ironmasters had recourse to the iron deposits of the southern part of Cleveland, and sought for the continuation of these deposits in the northern part. Here, rather over thirty years ago, that discovery was made which changed the fate of Middlesbrough,—the outcrop of iron being "found" in the high ground flanking the river Tees to the east of Middlesbrough, by Mr. John Vaughan, one of the partners in the firm of Bolckow & Vaughan, the leading ironmasters. The utilisation of that discovery changed Middlesbrough from being a mere coal-shipping port to one of the chief centres of iron production and manufacture in the world; made millionaires of the two principal ironmasters; and developed what had been a remote and isolated district until it is one of the most populous and prosperous towns in the North. By 1861, the population had risen to 18,273; in 1871 it was 39,434; and the recent census has shown that that growth continues, the return giving the present population at 55,978.

Before the discovery of iron at Eston, the total production of the north of Yorkshire was under 100,000 tons yearly; but the cheaply-wrought ironstone close to abundant facilities for its disposal has so stimulated the trade that the production has risen almost without a check until last year the extraordinary quantity of 6,441,783 tons was extracted from the Cleveland mines. No blast-furnace existed in Cleveland or on the banks of the Tees at the time of that discovery; but there are over 100 now,—a vast smelting plant which is larger on an average, and more productive, than that of any other iron-making district. And there has been in the half-century a growth as full, in comparison, of finishing ironworks, of foundries, of shipyards, and others of the iron-consuming industries, so that the whole of the north-east of England has felt to the full the benefit that has arisen from the growth of the great iron-producing and manufacturing centre. In the past decade, the district felt the force of the depression doubly, and that because, in addition to the general causes, there was the special effect arising from the fact that Cleveland iron was unsuitable for the steel manufacture. Continuous efforts have resulted in the resort to the dephosphorisation process, by which the vitiating elements are eliminated from the Cleveland iron in the Bessemer converter, and it is thus adapted for the manufacture of the more enduring and increasingly preferred metal. And thus there has sprung up, and is springing up, in the Cleveland district a newer industry, which is largely contributing to the removal of the effects of the depression of four years ago.

The half-century whose passing is to be commemorated has built up the chief town in Cleveland and the great industry on which it and others depend, and given to it all the essentials of vigorous town life. The rateable value of the thrice-extended borough has been raised in the five decades from a few pounds to 200,000*l*. Its School Board has provided accommodation for 4,310 pupils; its free library numbers many thousand borrowers lately; its gasworks make 166 million cubic feet of gas yearly; and the Middlesbrough part paid in the last half-year 15,114*l*. for the water it needed from the jointly-held waterworks; whilst the inadequate supplies are forcing the adoption of a vast scheme of reservoirs in Baldersdale. These are indications of the growth of the iron town, which boasts that it is the chief centre of iron production, and owns the greatest steelworks in the world. To those who fostered that trade, and gave to it the abundant supplies of cheap minerals on which it is built, it has long professed gratitude, and takes advantage of the jubilee celebration to put it in enduring mementoes. It has had its checks to prosperity in the dulness that it knew down to a year ago, but it is now about to make a further spring forward, and thus it is that the jubilee celebration may be said to divide the past from the future of Middlesbrough, and to separate the small coal-exporting town which has become the centre of the crude iron trade from that of the future, the dependence of which will be, it is in every way certain, upon some of the forms of steel manufacture, and probably on that of the Bessemer trade.

* A meeting of the Council of the Association will be held on Monday morning next, at Trinity College, Dublin, for preparatory business, and in the evening of that day the president, Lord O'Hagan, will deliver the inaugural address.

Birkbeck Literary and Scientific Institution, Southampton-buildings, Chancery-lane.—The 59th session of this Institution will commence on Monday next. Evening classes, which are open to both sexes, are held for the study of Ancient and Modern Languages, Mathematics, Natural, Applied, and Mental Science, Literature, History, Law, Art, Music, &c.; in fact, every opportunity is offered at this Institution for students to prepare for any occupation or profession. The fees are very moderate. The committee again appeal for contributions towards the new building.

BUXTON.

Remembrances are brought up at Buxton of those mountains Bunyan speaks of, where the rivers flowed with "fine trees on both sides," the meadows "are green all the year long," and where "all things are managed to the supporting of the weak." It is, indeed, the paradise of the invalid, but it is more than that,—it is the resort alike of the valetudinarian and of the pleasure-seeker; and hence lovely youth and crabbed age together press the floor of the pavilion, or watch the lawn-tennis players in the grounds. It is long since Buxton established its fame as a health resort, and to it there comes, summer and winter, a constant stream, to exercise the bath chairs that darken the front of the Crescent, or to wander in pairs by the banks of the Wye. The old Romans, who are supposed to have known the baths, were the predecessors of those who three centuries ago deemed them the most fashionable resort in the kingdom. Dukes and earls have been the benefactors of the little town. The ill-fated Queen Mary visited it in her imprisonment, and left on the window of the old hall her tributary farewell to the "milk-warm waters" of Buxton, and with the patronage of kings and queens the town rose into that pre-eminence that it still holds. Its attractions are natural and acquired. It is in the midst of some of the most noted scenery of Derbyshire; it has near to it some of the quaintand pretty rural nooks that attract visitors, but do not themselves provide for the continuous and comfortable stay of strangers; it has added to the charms of wood and water that it possesses; and it has springs and baths the medicinal value of which has been long esteemed. To these, the dukes of Devonshire in the past have added much. That fine pile, the Crescent Buildings, on which a century ago 120,000*l*. were spent; the terracing,—to coin a word,—of the rising-ground in front, under the direction of Paxton; the damming-up of the Wye till its waters form pools and cascades; the designing of the gardens and grounds of the Improvements Company; the erection of churches, chapels, and hospitals; the enlargement of ancient hotels, and the growth of villas,—these are the indications of the growth that chiefly in the last few decades has marked Buxton.

In its season there is no more perfect panorama of life in its many stages than is to be seen in this Derbyshire haunt. By the side of the perambulator is to be seen the Bath-chair of age that clings to life with a tenacious grip and hobbles to the pure air around these "delectable mountains" to stretch out its latest days; whilst around them are all the intermediate stages. In the early morning the number of Bath and invalid chairs drawn up in front of the baths, with their attendants, is a revelation of the popularity that Buxton possesses for invalids; whilst the tripping of fleet feet along the arcade in rainy weather, or the light laughter that in sunny days makes musical the paths that lead to Diamond-hill,—these portray the pleasures of youth in the ancient health resort. For all ages Buxton caters. It has its rink for the youth, its pavilion and gardens for the middle-aged, its baths for the infirm. When music arises "with its voluptuous swell" in pavilion or garden, there are revelations of the fashion of the visitors near; when sounds the bell there is along the colonnade a troop of the distinguished, and their vulgar followers, sufficient to make the old hotels gay, and to people the rooms of many of the villas. Buxton has recognised the fact that it needs to add to natural beauty the essentials of comfort, and of pleasant, social life, and these draw from a large and growing area the visitors on whose patronage the place depends. For it is a place apart from manufacture, and where commerce presents only the modest guise of an attendant upon pleasure. In the gray streets of Buxton, trade, in its ordinary sense, does not enter,—the neat shops are the temples of ministers unto the wants of fashion, and the trains that enter the station bear the invalids or the pleasure-seekers only. It offers to these pleasant society, comfortable homes, a retreat alike from the cares of business or the jading life of fashion in great cities. Away from the flutter and frivolity of Mayfair,—from the stress and strain of braiwork in Westminster, or from the guidance of great concerns in the manufacturing regions, this little nook,—an hour or two apart, but with the quietness of years between,—gives freshness in its valley and "knits up the ravelled" skein. All around it is the wonderful scenery of the Peak country,—

valleys such as that of Edale, caverns such as those of Castleton, mountain passes like Winyates, bleak moors like Millstone Edge, quaint villages like Eyam, where ancient customs die slowly, haunts of the artists such as Millersdale, resorts of the curious such as Haddon Hall, and that boast of Britain, Chatsworth. It is, then, no wonder that to this once solitary spot,—still retired from the stress and the struggle of life, there come increasingly those who desire to board the little strength left them, and those also who steal a brief respite from the struggle. Other and newer health resorts rush into a bourgeois popularity, and by dint of the blazoning of trumpets rise and fall in the fluctuations of fortune and trade, but this gem of North Derbyshire is secure in the patronage that its ancient fame and its present attractions give it, and all the year it draws to itself a distinguished circle.

FRENCH ART INDUSTRIES AND FOREIGN COMPETITION.

There has been, for some time past, a gradual dissatisfaction growing up among the rising artistic notabilities of France; an infinitesimal number of men have even ventured to opine that there was something wrong in France, after all; and the foremost promoters of art for art's sake, of art in every department of life, have discovered that in the home of the cold and calculating islander who loves nothing but his shop and his money-bags, there is an institution deserving mention, — nay, deserving imitation. Need we say that the institution in question is South Kensington? The men who have gathered round the founders of the French Museum of Decorative Art are in advance of their countrymen, and are anxious to see established, throughout France, schools after the pattern of our South Kensington schools. The establishment of schools such as those of England, of Austro-Hungary, of Bavaria, of Russia, of Belgium, is the great cry of the advanced artists in France. We were not surprised, then, to read in the *Review of the Decorative Arts* (*Revue des Arts Décoratifs*: A. Quantin, 7, Rue St. Benoît, Paris), an extremely large-minded and circumstantial article, which the author entitled, "A Danger," and in which he gives the French art-world a few serious and timely hints. He tells Frenchmen that they have for too long taken their supremacy in art as a matter of course. It has been said from time immemorial that France is the home of art, that Paris is the capital of taste and cultivation, that Paris leads the universe! All men have not taken this super-excellence for granted, however; has not Matthew Arnold said,—

"France, famed in all great arts,—in none supreme"?

Moreover, as we have pointed out, it is actually from a Frenchman that we have the cry of alarm respecting the falling-off of art-products in the "capital of art."

M. Saint-Juirs, in the *Review of the Decorative Arts*, asks one or two trenchant questions. Are the French people really the first artists in the world? What is their absolute and relative art influence? Is their art-power increasing or decreasing? Are they losing or gaining ground? Have they anything to fear from competition? The only manner in which these questions can be answered, says M. Saint-Juirs, is by figures; thereupon he plunges boldly into a perfect wilderness of figures. With regard to the fine arts, figures are easily supplied by glancing at the books of the *Salon*, which is the French equivalent of the Royal Academy show; while with regard to figures respecting art applied to industry, the accounts kept by the Customs authorities furnish all the information necessary. We know that, in the department of Fine Arts, 416 foreign artists exhibited at the *Salon* of 1880, side by side with 1,439 French artists. The fact is significant enough, says M. Saint-Juirs, but is by no means as telling as the result of the inquiry into the state of commerce with regard to industrial art. Nothing could be more instructive and interesting than the figures brought forward by M. Saint-Juirs; and he states very precisely the condition of the industrial art imports and exports in 1859,—that is, before the Free Trade reforms were instituted; and in 1880.

In 1859, France imported manufactured articles (not including food products and raw materials, in which no art is displayed) to the value of 2,464,000*l*. In this total, all that represents drawing, engraving, painting, sculpture, is worth 1,000,510*l*.

In 1880 the French imported manufactured articles to the value of 19,937,880*l*., in which sum artistic articles stand for 5,919,240*l*.! The development of foreign art industry is indisputably felt in these figures, and it is not strange that the French should be alarmed at the decrease in French supremacy.

It would be too long, M. Saint-Juirs observes, to go into all the figures; but he gives a summary of the imports of the principal articles in 1859 and in 1880:—

	1859.		1880.
Chinaware and stoneware	£9,009	.....	£176,560
False stones, enamels, stained glass	17,015	.....	114,998
Wall-paper	23,105	.....	56,610
Books	96,442	.....	176,765
Engravings and lithographs	14,194	.....	253,737
Cut coral	8,757	.....	98,361
Jewelry and gold work	10,840	.....	218,040
Artistic weapons	40,7·2	.....	106,441
Furniture	39,165	.....	189,865
Curiosities for art-collections	81,510	.....	426,164

Tissues are not included in this list: the writer considered that they deserved a special paragraph. His figures respecting tissues concern, of course, the brocaded, embroidered, printed stuffs, and laces,—there is no question of any materials in which art is not employed,—and they show, in spite of the great falling off in two departments, thread lace and Indian cashmere shawls, a considerable increase in importations of tissues. In 1859, the tissues imported were valued at 579,285*l*.; in 1880 the sum had increased to 3,589,218*l*.; and these figures are added to the total imports already mentioned.

To turn to the exportation side of the matter, it will be seen that the total export of French manufactured articles in 1859 was valued at 56,116,000*l*., of which sum, 26,619,400*l*. represented the worth of the artistic products. In 1880 the export of French manufactured articles had reached the figures of 74,034,560*l*., in which sum artistic products were represented by 30,644,920*l*. Therefore, while in 1859 the artistic products figured in the total exports at the rate of 47 per cent., in 1880 they reached only a figure of 41 per cent. of the total exports.

These figures are of the utmost importance, as M. Saint-Juirs points out; they are significant, and should not be disregarded by the Frenchmen who are always ready to cry, after the manner of M. Alfred Assolant, that a Frenchman has nothing to do but to remain in France, a thorough Frenchman, and every honour, every distinction, will come upon him as a mere consequence of his nationality. Frenchmen of this type would be benefited by the sober study of the figures brought forward. Here is the broad fact, undeniable, incontrovertible; in 1859, the French imported artistic wares of all kinds to the value of 1,579,795*l*., and in 1880, the imports had reached the value of 9,508,464*l*. Compared with these figures, the increase of the art-wares exports during the stated years, from 26,619,400*l*. to 30,644,920*l*., seems small indeed. From 1859 to 1880, the exportation of art-wares has, therefore, increased at the rate of 15 per cent., while the importation of art-wares has increased at the rate of 488 per cent.!

The exportation of certain classes of art-products has sensibly diminished. The export of splendid silk materials, the brocaded silks, embroidered and stamped silks and velvets, &c., which were the glory of Lyons, has dwindled to a very low state; linen artistic stuffs have decreased, and the same may be said of art copper-work, cut coral, playing-cards, and china. The startling decrease in the export of china is, however, compensated by the increase in the exports of stone-ware, terra-cotta wares, &c. In many departments there has been, of course, a fair increase. The exports of art-bronzes have nearly doubled, while the exports of sculptured marble have more than doubled. Goldsmith's work and jewelry exports have almost quadrupled; and art-furniture exports have just about doubled.

These figures, gathered together and classified by M. Saint-Juirs, with great ability and impartiality, show indubitably that art industry is progressing at a greater rate in other countries than it is progressing in France, and that a serious competition has been growing up in the lands that the French have been content to consider destitute of art. There are many things to be considered while glancing at this evident discomfiture of French art. Are the imported art-products really works of art? Do they display serious culture, genuine feeling for art? If they do, they undoubtedly constitute a real menace to French supremacy. If, on the other hand, these imported articles are bad as to design and colour, then they must degrade the national taste. The foremost among artistic Frenchmen are inclined to believe that the art-industry of their native country is being lowered, is losing some of the exquisite taste of design and workmanship which has been for years its hall-mark; and they declare that the decadence is due to the urgent need of art schools and special museums, where the young idea may be ably tutored and trained in the way it should go. They demand for France the "vulgarisation of art-teaching,"—to use the expressive term of an enthusiast of some thirteen years ago; and they do their best to remind the French people how at recent exhibitions it was shown that England was on a level with France in the furniture and china departments,—that Austria was on a level with France by reason of her bronzes,—that Italy was on a level with France by reason of her glass ware. Japan is becoming a dangerous competitor, and Belgium and America are making giant strides; and France must make up her mind to give her workmen a complete artistic education, and better opportunities of widening their intelligence and increasing their knowledge. Some Frenchmen assert angrily that France has been despoiled of her native industrial art-workers, who have found homes in other lands. It is quite true that French artists of all descriptions have settled in foreign countries, and notably in England; but it is also true that the points which the intelligent and highly-skilled workmen appreciate in foreign countries, and which they have never as yet enjoyed in their native land, are political liberty and good pay.

THE THAMES AND MILFORD HAVEN: DOCKS IN BOTH HARBOURS.

In our recent notice of the project for the creation of new tidal docks for London, we referred casually to the noblest harbour in the British isles, if not in the whole world,—Milford Haven. The publication of the "admirable scheme for providing deep-water dock accommodation for the port of London," has called forth from the secretary of the Milford Docks Company some remarks to which we are happy, not only to call attention, but to add some emphasis from long and intimate acquaintance with the noble Pembrokeshire harbour.

Milford Haven, Mr. Hood remarks, is 170 miles nearer New York than Liverpool, and 264 nearer than London. Such comparative measurement may be widely extended, and continually to the advantage of Milford. Any one who will take the trouble to turn to the terrestrial globe will see that Milford Haven is, in point of fact, the maritime centre of the world. That is to say, that if we seek the point from which the greatest number of ports can be reached by the shortest voyage, that point is the entrance of Milford Haven. Once out of the narrow channel that admits the sailor within St. Anne's Head, a vessel is well at sea,—is in mid-ocean. As an instance of the convenience of Milford, in days when sailing-vessels played a greater part in commerce than is now the case, we can mention a fact within our own personal knowledge. In 1855 a small cargo of railway materials was despatched from Neyland, near the head of Milford Haven, to Lisbon. The consignees wrote in due course by the day's mail to advise the despatch. The little brig arrived at Lisbon before the letter of advice, aided by the services of railway and steam-packet for the carriage of the mail! For sailing-vessels, indeed, the advantage afforded by Milford, when the wind is in fifteen out of sixteen points of the compass, has been long known to the sailor. Steam-vessels do not so much depend on wind and tide as did sailing-vessels; but the advantage of position in shortening voyages is none the less, and it is one on which the navigator may safely calculate at all times.

On the 15th of the past month, we are glad to learn from the letter of Mr. Hood, the largest caisson ever built was successfully floated across the graving-dock entrance of the new docks at Milford, effectually closing in sixty acres of water. There is not, the secretary to the Milford Docks adds, to his knowledge, "an instance on record of so large an extent of water space being closed in by a single caisson." The caisson is 100 ft. in length, 15 ft. in breadth, and 48 ft. in height. Its weight is 48 tons. The graving-dock is 710 ft. long, 96 ft. wide, with 34 ft. of water on the sill at high water.

By the aid of caissons it can be used by ships up to 700 ft. in length, and can also be used as a lock entrance,—an important feature in view of the size of some of the vessels now being constructed for the American trade.

The Milford Docks will have a water area of thirty acres available for large ships, and quay-berthing accommodation to the extent of 9,840 ft. All the latest appliances for coaling, and for loading and discharging cargoes, will be provided. It should be remembered that the Haven itself forms a natural basin in which the whole navies of the world might safely ride in any weather. There is no place in England in which artificial docks might seem to be so little required; and the fact of their having been now constructed to such an extent, with such facilities for entrance from the harbour, presents an accommodation to commerce such as, we should think, is nowhere else to be found. As far as the outer world is concerned, Milford has the advantage over any port in the United Kingdom, both for position and for unlimited capacity, as well as safety. To this is now added, the convenience of floating basins allowing of easy loading and unloading.

The journey to London by rail can be performed in six hours and a half, and when the Severn tunnel is completed, the distance will be considerably shortened. Direct communication with Manchester, Birmingham, and the Midland counties, as well as with the industrial districts of North Wales, is also commanded by railway.

It is a curious coincidence that on the same day on which Mr. Hood's letter calling attention to Milford Haven was published, there appeared an invitation, to persons concerned in shipping, to inspect the *Great Eastern* steamer, now on sale, and at anchor in Milford Haven. This monster of the deep, in the construction of which the engineer has almost rivalled the mechanism of organic life, has a gross tonnage of 22,500 tons, and a nominal steam-engine power of 2,600 horses. Its cost now stands in the books of the company at 86,000*l.*, and it is said to be in excellent order. Its length between perpendiculars is 680 ft.; its length on deck, 691 ft.; its extreme breadth, 83 ft.; the depth of side, 58 ft.; and its estimated draught when laden, 30 ft. There is a close and melancholy connexion between the *Great Eastern* and Milford Haven. One of the facts that have hitherto militated against the commercial value of the great ship is that it is too large for almost any port. It is certainly too large for the Thames, as regards both convenience and safety. At Milford Haven there is room for a fleet of *Great Easterns*.

The *Great Eastern* was the last and favourite child of the gifted Isambard Kingdom Brunel. The writer of these lines had much intercourse with that great engineer on the subject of this vessel. Mr. Brunel told, in his dry way, how one or two friends called upon him and asked if he thought it possible to build a steamboat 1,000 ft. long. Mr. Brunel replied that he should not like to say how large a vessel he thought might be built, lest he should be thought wild; but that he thought it would be more prudent to try a little one of 700 ft. long to begin with. On that advice the *Great Eastern* was set in hand. It was proposed to Mr. Brunel to build the vessel at Neyland, opposite Pembroke Dock, where a deep "pill," or sheltered creek, forms a natural building-dock. The plan proposed was, to build the keel of the vessel, float it as soon as a couple of plates in height had been put together, and then build the rest afloat. The cost and risk of launching would have been thus avoided. Mr. Brunel pondered for some three weeks, and at last decided on the Thames, exclusively on the ground of the convenience of locality, as he would be able to run down daily from Westminster to see the vessel in progress, while to Milford the journey was formidable. England has had cause to regret this decision, powerful as were the arguments in its favour. It was impossible to launch the *Great Eastern* in the Thames, in the ordinary way, as she would have imbedded herself in the opposite bank of the river. Hence followed the novel and dangerous expedient of the side-way launch, attended not only by mishaps, but by enormous expense, and tending more than anything else that can be suggested to shorten the days of Mr. Brunel. That cost, that mishap, and that anxiety, would all have been avoided if the proposal to build the necessary shops and to undertake the construction of the vessel in Milford Haven had been accepted by the great engineer.

PORTRAITS OF AMERICAN PRESIDENTS.

The deplorable death of President Garfield suggests the memory of the series of portraits of the Presidents of the United States that hang in the Capitol at Washington. It is a noteworthy fact, and one, perhaps, that has not unfrequently been observed, that august personages have not always been fortunate in the manner in which they have been portrayed by painters and sculptors. Of the large number of royal persons that have existed within past centuries, it is difficult to point to many pictures or statues as perfectly faithful or trustworthy representations. Though we possess a curious and almost complete series of our English kings and queens, how many of these portraits are there that we may look upon with thorough faith? How many represent their originals, not from a preconceived and artificial conception of their appearance, but as they really lived? We feel that we may rely on Holbein's portraits of Henry VII. and of Henry VIII.; and the many representations of Queen Elizabeth concord sufficiently to enable us to form some just idea of the Virgin Queen. Van Somers has pictured us James I.,—is it, however, really the pedantic Scotchman Macaulay has so unflatteringly portrayed in one of his literary profiles? On Walker's representation of "Old Noll" we may thoroughly rely for a portrait of Cromwell. Van Dyck, though he flattered his models, has fixed for ever in our minds the Charles I. of history; Lely's powers of accuracy we doubt too much to trust to his version of Charles II.; the eighteenth century was too artificially courtly for us to place our faith in any royal portrait of that age, and it is not till we meet Reynolds that we can venture to rely on any existing portrait of George III.

The American Presidents have been no more exempt from this fate than the crowned heads of the Old World, and of the nineteen Presidents who preceded General Garfield, but one has been portrayed by a painter on whose powers as an artist and as a delineator of nature at the same time we may perfectly rely; we refer to the portrait of General Washington by Gilbert Stuart, and that portrait, curious to say, is unfinished, the head being all that is painted, the rest being what painters call "clean canvas."* Stuart was well aware of the merit of his work, and was wary enough not to complete it, using it as the original from which he copied the innumerable portraits of the founder of the American republic that were at the time distributed over the United States, and which bear Stuart's name. The painter cleverly succeeded in retaining his original portrait, which is now one of the most justly-prized of the rapidly-increasing artistic treasures of Boston. Taken late in Washington's life (in 1794), and representing him at a period when the costume of the courts of Europe was exceedingly elaborate, Washington at his request is dressed in black velvet, with the powdered wig and black "bag" of the period. The truthfulness of the resemblance, even if we had not the authority of contemporaries, would be shown by evidences in the work itself that are unmistakable to the experienced eye, so much so that the amusing story,—one we believe not generally known,—that Washington waited before sitting for his portrait until a new set of teeth arrived from Paris,—is confirmed by the peculiar expression of the mouth which the painter in his truthfulness, perhaps in his humour, made perfectly evident. A more than usual interest is attached to this portrait, not alone on the score of its historic and artistic value, but from the incidents by which both it and the painter are connected with England, and for the facts of which the still-existing traditions,† and the statements of Dunlap, —the Horace Walpole of American art,—are evidence.

It was from his unfinished portrait that Gilbert Stuart painted the large portrait for the Marquis of Lansdowne, from which was engraved at the time James Heath's superb and well-known work. Copyright laws between England and America no more existed in those "good old days" than now, and we can well understand Stuart's feelings at the success of Heath's print, though he jokingly remarked (and Stuart has left behind him the reputation of a wit), with reference to the inaccuracy of the engraver's mention of his name as "Gabriel," "Men will make an angel of me in spite of myself."

Gilbert Stuart, like most of his contemporary brother artists, crossed the Atlantic, and in the days when not a few Americans remained still good Britishers,—Stuart's father was a Scotchman,—found his way to London, and here he remained some years. To West, as might be supposed,—being, like himself, an American,—young Stuart went, and in his studio in quiet Newman-street saw most of the visitors to the favourite painter. There is a story extant that one day Dr. Johnson called on West to gather from him any information he might possess regarding America. West, who had left his native country some years, referred the Doctor to his newly-arrived pupil, young Stuart. After some conversation, Johnson patronisingly asked the witty young American who had so pleased and instructed him, where he had learned such good English; to which Stuart's prompt, if scarcely polite, reply was, that he could better tell where he did *not* learn it,—from the Doctor's Dictionary. Stuart quickly gained a name over here, and from York-buildings, where he had first lodged, he moved to a fine house in Berners-street, Oxford-street, at the very respectable rent for 1782 of 150*l.* a year.* Our National Portrait Gallery contains two portraits by Stuart, —one of Kemble, the other of his old friend and master, Benjamin West.

* Resembling in this treatment the well-known portrait in our National Portrait Gallery of William Wilberforce by Sir Thomas Lawrence.

† The writer in 1849 had the opportunity, in America, of frequently meeting the two daughters of Gilbert Stuart, two old ladies whose anecdotes relating to Washington and his period were as famous in America as were the recollections with us of the Misses Berry.

THE NEW EASTBOURNE AND TUNBRIDGE WELLS RAILWAY.

In the course of the last few years many important new works have been executed by the London, Brighton, and South Coast Railway Company in numerous localities embraced by the company's system. These works have included the erection of many new passenger, goods, and coal stations, and the enlargement and re-arrangement of others, and also the construction of new lines for the accommodation of the growing traffic of the company; one of these, the communication between Chichester and Midhurst, was noticed in a recent number of the *Builder*. The last completed extension of the company's system is the line between Eastbourne and Tunbridge Wells, which is now finished by the completion of the important new station and works at Polegate, near Eastbourne. Another and much larger extension than either of those referred to is rapidly approaching completion in the new lines, upwards of forty miles in all, that will provide, practically, an additional trunk line from Croydon to Lewes, Newhaven, and Hayward's Heath, *viâ* East Grinstead. These extensions in East and West Sussex, and across Surrey and Sussex, are revivals of schemes that were projected, and the works partly executed, many years ago.

Several surveys for a line to connect Eastbourne with Tunbridge Wells were made before the scheme as now carried out received Parliamentary sanction. These were promoted by the Brighton Company, by the South-Eastern Company, and by independent companies. The Surrey and Sussex was resumed after having been abandoned for a time; it was the scheme of an independent company, and was next taken up by the Brighton Company, by whom the works are being executed. East Grinstead will be a principal station on this line, being at the point of intersection of the lines from the Isle of Wight, Portsmouth, Littlehampton, Horsham, and Three Bridges on the west and south-west, and Tunbridge Wells on the east, and the new line from north to south between Croydon and Lewes. Although East Grinstead does not now return, as it once did, two members to Parliament, it is a place of considerable and growing importance. The parish, the largest in Sussex, contains 15,072 acres. It has a population of nearly 10,000, the increase during the last ten years having been 1,185.

The earliest proposals to give Tunbridge Wells the benefit of railway communication excited the hostility of the owners and occupiers of property, who feared that injury would result from

* Mrs. Hoppner, in a letter quoted by Dunlap in his "History of the Arts of Design in America," writes under date June 3, 1783,—"Mr. Stuart has taken a house, I am told, of 150*l.* a year *rent*, in Berner's-street, and is going to set up as a great man."

facilities for reaching their charming locality quickly, and at moderate cost. With experience of the influence of railways in promoting the comfort, convenience, and prosperity of the inhabitants of the districts they reached, and in increasing the value of real property, opinion changed, and owners of property who had formerly opposed local railways became their strongest supporters. The first line that reached Tunbridge Wells was made with the full consent of all parties interested, was unopposed, and was actually made without even the powers usually conferred by an Act of Parliament.

The desire for railway communication between Eastbourne and Tunbridge Wells existed long before Parliamentary powers were obtained for the construction of the line now completed. We believe that the Duke of Devonshire, to whom the great part of Eastbourne belongs, was prepared to make a line himself, if a company could not be induced to undertake it. The Brighton company took up the project, and have made the line. A portion of the route was already in their hands in the lengths from Polegate to Hailsham, at the southern end, and between Tunbridge Wells and Eridge on the north. To link together these two stations, and to provide continuous communication between Eastbourne and Tunbridge Wells, about 16¾ miles of new line were needed, and have been provided.

On the new portion of the line there are five stations. Polegate and Hailsham had already their stations; at Polegate a new and admirably appointed station has been provided, and the buildings that have hitherto served for the accommodation of the passenger traffic will be converted into a goods station, or put to other uses.

Before referring more particularly to the new line, it may be admissible to state a few facts concerning its termini. The older parts of Eastbourne,—Meads, Southbourne, and Seahouses,—are of great antiquity, their historic traditions, dating much further back than the time when William the Norman and his host landed in Pevensey Bay, close by, before the battle of Hastings. The locality was the site of a Roman settlement, and many interesting Roman remains have been found near the coast at that place. Eastbourne is, however, a comparatively modern creation as a favourite watering-place, and now one of the finest on the coasts of the United Kingdom. Its well-merited popularity may be attributed to a combination of causes,—the grandeur of the coast, the breezy downs, pleasant walks, pure air, mild climate, excellent sea-bathing, efficient sanitary provisions, the number and superior character of its hotels and residences, and last, but not least, the munificence and taste exercised by the Duke of Devonshire in effecting public improvements. In 1801 the population of Eastbourne was 1,668, in 1821 it was 2,607, in 1851 it was 3,403, in 1881 it has reached to 24,333, with 3,821 inhabited houses, the increase in ten years having been 11,356 in population, and 1,573 in inhabited houses; its area is 19,145 statute acres.

Tunbridge Wells, at the northern end of the new line, has had the start of Eastbourne as a fashionable place of resort for those who seek after health and pleasure. It is, excepting Bath, perhaps, the oldest and most charming inland watering-place in the kingdom. So long ago as 1606, it is chronicled, Dudley, Lord North, accidentally discovered the medicinal virtues of the chalybeate springs at Tunbridge, which led to the fame of the place, but its remarkable growth has been since the commencement of the railway era. For long after the days of Lord North, the Wells were treated as an appendage of Tunbridge, and the statistics of the one place were included with those of the other. It may suffice, to show that Tunbridge Wells, like Eastbourne, is a place that grows rapidly, to state that in 1861 its population was 13,807, and in 1881 was 30,352, or considerably more than double. The increase in population in the twenty years has been 16,545; in inhabited houses, called 5,733 by the census of 1881, the increase has been 2,240. The population of Tunbridge town at the last census was only 14,687, or less than half that of Tunbridge Wells.

Eastbourne and Tunbridge Wells have in common a beautiful feature in the interspersion of fine greenery with the buildings; the rows of flourishing trees in the streets and roads of Eastbourne, and the preponderance of private dwellings and residences of professional men and gentry over ordinary places of business, are remarkable. Tunbridge Wells abounds in rich and varied beauties peculiar to itself and the district in which it is situated, notably in its fine commons and picturesque rocks.

Leaving Eastbourne by rail, and looking back upon it, a pretty view is obtained of a considerable part of the town, and of the tops of the long range of Martello towers that stud the coast. Eastward, in the direction of Hastings, an extensive plain affords excellent pasturage for the live stock of various kinds that are so plentifully sprinkled over it. This large area includes the Willingdon and Pevensey levels. Polegate Junction is reached at a few miles' distance from Eastbourne.

The through Brighton lines between east and west pass between long platforms at the station. There are four of these platforms, each 600 ft. long by 30 ft. wide, and for the greater part covered with elegant roofs of glass and iron. The station buildings are an imposing pile. Red and white brickwork does not resist the influence of saline breezes, which discolour and disintegrate frontages built in such material; the Polegate Station buildings are accordingly faced in cement, and the style adopted is Italian. The other station buildings on the new line are Old English, with fronts of red and white brick, the dressings and mullions of the windows being of Portland stone. The roofs of the Polegate Station buildings are covered with slates; those of the other stations with flat red tiles, and finished with terra-cotta finials and ridges. On the ground-floor at the Polegate Station the principal block of building has suitable conveniences at the extreme end of the building; then follow a cloak-room, 15 ft. square; passage for luggage; ticket and telegraph office, 15 ft. by 16 ft.; booking-office, 30 ft. by 16 ft.; waiting-room, 16 ft. by 12 ft.; a ladies' room, lobby, and at the extreme end again, station and house coal-stores. On the platform level, 14 ft. higher than the ground-floor, there are lobby, closets, &c.; ladies' room, 16 ft. by 11 ft.; general waiting-room, 20 ft. by 16 ft.; refreshment-room, 24 ft. 6 in. by 16 ft.; and a kitchen, 16 ft. by 9 ft. There are also provided a station-master's room, 15 ft. by 11 ft.; and a ticket-collectors' room, 13 ft. 6 in. by 11 ft. The station-masters' residence, on the first floor of the station buildings, includes a sitting-room, 18 ft. by 12 ft.; kitchen, 12 ft. square; with three bedrooms of about 12 ft. square each. Station-master's family accommodation is provided at all the stations. The subway for communication between the platforms at Polegate station seems a good piece of work. It is 150 ft. long, 10 ft. wide, and 8 ft. 6 in. high, lined with white enamelled bricks, and well lighted with Hayward's patent lights. There is communication by a double flight of steps between the subway and the central platform, and by single flights with each of side platforms. Provision on a liberal scale is made, or is in progress, for the accommodation of goods, mineral, and cattle traffic. Goods and mineral traffic are provided for at all the stations on the new line, which commences at the thriving market town of Hailsham, population 6,702.

A railway line nearly seventeen miles in length, traversing an undulating country, crossing many roads and streamlets, and that has occupied four years in construction, which is about the time since Mr. Joseph Firbank, the contractor, commenced operations, implies much hard work and clever contrivance, displacement of material in some places, and deposit of material in others. There are fifty distinct cuttings and forty-nine embankments on the line, and seventy-four bridges and culverts. The line crosses the Redmill stream nine times, and also crosses the River Cuckmere, and many smaller streamlets. The summit of the line is near Heathfield, about eight miles from Hailsham, or nearly half-way. It is 384 ft. higher than the level of the line at Horsebridge, the lowest point. The gradients and curves are for the most part easy, and all perfectly practicable. The contour of the country is partly indicated by the fact that on each side from the summit there are rising and falling gradients, and reaches of level. The bridges over and under, culverts, and other engineering works, are not of a character to call for special remark. The station works at Polegate, Mayfield, and other places have a stronger claim for notice. The first new station on the line after leaving Hailsham is at Hellingly, a pretty country town and parish of about 6,700 inhabitants. As may have been already inferred, there is just about the same proportion of the line on embankment as there is in cutting. In almost every instance of the open being reached, beautifully picturesque scenery, sometimes in extensive reaches, presents itself, charming in its variety and gradations of light, shade, and colour. The country is well wooded, but has also many hop-gardens, meadows, and fields under cultivation between the clumps of plantation. Game of various kinds is abundant, good for huntsmen as well as "hoppers," who do not, of course, follow their distinctive pursuits simultaneously.

Horeham-road is the next station. The scenery near this station is very fine, and includes a beautiful view across the valley of the river Cuckmere, which reaches the Channel at Seaford. At Heathfield, and near it, there have been some very heavy works in cuttings and in embankments, and in a tunnel of about eleven chains, cut through very hard rock. Some of the embankments, containing immense masses of earthwork, gave much trouble hereabouts, from spreading out at the base. They seem now thoroughly consolidated. Heathfield Park, near the station, now in the occupation of Lord Claud Hamilton, M.P., was at one time the residence of Lord Heathfield, of Gibraltar renown. When Sussex was celebrated for the iron produced in the county, Heathfield was famous as a cannon foundry. It has one of the largest corn-markets in Sussex.

Mayfield, seen from the line, presents a very pretty picture. The scenery around is very charming, and a succession of fine views is commanded from the line. The archiepiscopal palace is a well-known relic of architectural and antiquarian interest. It was the favourite residence of the Archbishops of Canterbury from the time of St. Dunstan to Cranmer. In 1573, seventeen years after Cranmer's martyrdom, Mayfield Palace was in the occupation of Sir Thomas Gresham, the famous London citizen and founder of the Royal Exchange, and he in that year fêted Queen Elizabeth at the Palace. It was purchased in 1863 by the Duchess of Leeds, and converted into a convent, under the architectural direction of Mr. Pugin. The fine banqueting-hall is used as the convent chapel. The Mayfield district has many attractions for naturalists as well as antiquaries. We notice that the Brighton and Sussex Natural History Society had a field excursion to Mayfield on the 10th ult. The Mayfield Station is the largest on the new line, excepting Polegate, which is entirely different in external appearance and internal arrangements. The other stations are similar to that at Mayfield, in general appearance and internal arrangements, only somewhat smaller, and have not some of its adornments in the shape of lead-fret glazing and tinted glass.

Rotherfield, from the river Rother, that for part of its course is the boundary between Sussex and Kent, is the last station on the new line, although not the end of the route. In this neighbourhood the line skirts the shoulder of Argus Hill, an eminence of considerable height upon a terrace. Near here also is Crowborough Lodge, the seat of Mr. C. L. Prince. Crowborough Beacon is an eminence 804 ft. high, upon the summit of which is an astronomical observatory.

The line from Lewes joins the new route before entering Eridge station. At a short distance beyond the station a newly-made curve strikes off to the left for Withyham to join there the line from Tunbridge Wells to East Grinstead and numerous other places and junctions; the other curve, to the right, continues the line past Groombridge station to Tunbridge Wells,—the end of the journey.

It is not too much to say that the new line passes continuously through a country that presents a marvellous assemblage of the beauties of nature; among hills and vales, woods and brooks, lawns and rocks and groves, orchards and hop-gardens, scenes that are here "wildly noble," and there,—

> "By shallow rivers, to whose falls,
> Melodious birds sing madrigals."

The principal landowners through whose property the line passes are the Marquis of Abergavenny, Mr. H. Dalby Hunt, representatives of the late Mr. F. A. Schroeder, Mr. W. Tooth, Sir Charles Wm. Blunt, bart., &c.

The line was laid out by Mr. F. D. Banister, engineer-in-chief of the Brighton Company; contractor Mr. Joseph Firbank; signals are by Messrs. Saxby & Farmer; designs for stations by Mr. Myers, of Westminster; station works by Mr. Longley, of East Grinstead. The resident engineer is Mr. S. Paine; contractor's superintendent, Mr. Throsall.

The new line is single, except at stations, where accommodation for traffic in sidings is provided. The slopes of cuttings and embankments are 1½ to 1.

REVIEW OF THE HALF-YEARLY MEETINGS OF THE RAILWAY COMPANIES.

THE METROPOLITAN RE-ASSESSMENT AND THE SURVEYORS.—INTERESTING STATISTICS.—LARGE OUTLAY ON NEW LINES.

THE reports presented at the half-yearly meetings of the several railway companies which have just been held will in many respects be found to be of a specially interesting character. As regards several of the great lines having termini in the metropolis, the invidious position of the surveyors and valuers under the recent re-assessment of property in London formed a prominent subject of discussion and complaint. At the meeting of the *Great Eastern Company*, the chairman, adverting to the question, said that the magistrates themselves had denounced the system of employing gentlemen as valuers and surveyors who were paid by a percentage on the amount of their assessments. In proof of this the chairman quoted the remarks of Mr. Edlin, the Assistant Judge, on a recent appeal at the Middlesex Sessions. On that occasion Mr. Edlin observed that "it was elicited from an eminent surveyor and valuer that, being employed by the overseers, his remuneration depended on the increased amount in the assessment of the rateable value of the property of the parish, as compared with the last valuation list. It was the unanimous opinion of the court that they could not too strongly reprobate such a system of payment. It was calculated to destroy the value of testimony offered in court, and to shake their confidence in any figures brought before them, besides creating dissatisfaction and annoyance in the minds of all ratepayers whose valuations were increased. The only object of parish officers and assessment committees should be to put a just and reasonable valuation upon the property within their district, and any valuation which gave a personal pecuniary interest to the valuer must necessarily be open to grave suspicion." The chairman of the *North London Company* also drew the attention of the shareholders to Mr. Edlin's observations from the bench. The chairman, in continuation, said he admitted that these surveyors ought to be paid handsomely, as they were gentlemen of education and experience, and had a position in society, and he was not desirous of depreciating them or derogating from their services, but what he insisted upon was that if they paid such a body of men on the principle of receiving 5 per cent. on the increased value of the assessment, it was an inducement for them to do what was not quite correct. The subject was likewise alluded to by the chairman of the *Midland Company*, who observed that in the parish of St. Pancras, as they were all aware, the company had a very valuable property, which had been assessed for the last five years at the annual value of 53,700*l*. At the late re-assessment the parish engaged the services of a competent rating surveyor, on the terms of 5 per cent. commission on the increased rateable value he obtained, and acting on his valuation they claimed an assessment of 79,000*l*. The directors, thinking that some increase ought to be made, and anxious to avoid litigation, offered to settle an assessment of 60,000*l*., but this was declined, and the Assessment Committee, when appealed to, supported their own surveyor. The case was ultimately referred to Mr. Pownall, an arbitrator of very large experience, who reported to the Court of Assessment Sessions that the fair rateable value was 58,289*l*., which the Court confirmed, awarding to the Midland Company the costs of the appeal and arbitration.

From the general proceedings at the meeting of the *Midland Company*, it appeared that during the half-year there had been an increase in coaching traffic of 15,955*l*., and from minerals 74 690*l*., and a decrease in merchandise traffic of 37,996*l*., and in cattle 6,110*l*., the net increase being 46,539*l*. The number of first-class passengers carried had been 954,323, or 15,138 less than last year, and the number of third-class passengers 11,818,749, or 214,341 more than last year. The total capital expenditure during the half-year on lines open for traffic and on lines and works in course of construction had been 702,822*l*., and the estimated capital expenditure for the current half-year was 950,000*l*., and for future half-years 3,734,784*l*. As to the Poplar goods station and dock, it was stated that the river-wall and dock are now finished, and that the gates being completed, the water can be let into the dock, and the coffer-dam removed. The sidings were being laid for the yard and branch. The large warehouse was built up to the second-floor level, and the smaller one up to the first floor. Buildings for the hydraulic machinery had likewise been commenced. The works at the Tottenham and Hampstead north curve had been commenced, and the retaining-wall of the junction with the main line, together with the covered ways, and the cutting near the Brecknock-road, were in progress. It was stated at the meeting that the growth of the traffic in and out of London had rendered essential a second tunnel between Haverstock-hill and Finchley-road. A contract was entered into in March last for the construction of the tunnel. The works had been commenced, and the shafts were all in a forward state, which would enable the contractors to proceed with the tunnel immediately. In the course of the meeting the chairman alluded to the question of brakes, the introduction of which is now being insisted upon by the Board of Trade. He stated that the company had at present 57 engines and 209 vehicles fitted with the Westinghouse automatic air-pressure brake appliances; 202 engines and 2,074 vehicles fitted with the Saunders and Bolitho automatic vacuum brake appliances, of which 80 engines and 809 vehicles were fitted in the last half-year. They had likewise 26 engines and 115 vehicles fitted with Smith's vacuum brake, and they had 2 engines and 11 vehicles fitted with Barker's brake.

The report of the *Great Western Company* stated that there was an increase in the traffic receipts as compared with those of the corresponding half-year of 1880, of 49,042*l*., passenger traffic, merchandise, and minerals having all partaken of the increase. The dividend declared was at the rate of 4½ per cent. per annum. The progress of the Severn Tunnel formed a prominent feature in the report, which stated that during the past five months about 270 ft. of the permanent tunnel under the Severn had been completed, and a total length of 530 ft. of the arch of the tunnel had been formed under that part of the river known as the Salmon Pool, to the westward of the sea-wall shaft. In answer to a question by Sir Charles Whetham as to whether they were tunnelling under the land or the water, the chairman replied that they had tunnelled under the most difficult part of the water, and that a most difficult part was accomplished, which was called the Salmon Pool, on the English side of the Severn. The tunnel was roofed in there and completed, and it was the only portion where they really had any anxiety. At the meeting a vote of 60,000*l*. was granted for the following works now in progress:—Doubling the Wilts, Somerset, and Weymouth line between Waltham and Maiden Newton, 14,000*l*.; new offices at Paddington and enlargement of the station, 20,000*l*.; Plymouth Docks, additional accommodation, 8,000*l*.; Swansea East Dock coal-tips, 15,000*l*.; and new passenger station at Tilehurst, 3,000*l*.

The *Great Northern Company's* report showed that the gross traffic receipts of the company during the half-year amounted to 1,541,179*l*., as compared with 1,514,465*l*. in the corresponding period of 1880. The traffic for the half-year, the report observed, had been well sustained, though during the serious interruption caused by the severe winter, in January and February last, there was a large falling off in the receipts, and at the same time a considerable increase in the working cost. In the course of his remarks at the meeting, the chairman drew attention to the continued decrease in the number of first-class passengers, and the increase of third-class passengers, observing that there had been a decrease in the first-class of 6,187 in numbers, and a decrease in money of 6,172*l*. There had been an increase in the second-class of 49,402 passengers, but a decrease in money of 4,227*l*., which was accounted for by the short distances. The majority of the second-class passengers had travelled in the suburban districts, where the distances were very short and the fares very small. There had been an increase in the third-class of 442,945 passengers, and an increase in money of 5,905*l*. The percentage of first-class passengers was on the whole decreasing, and was now only 4½ per cent. The second-class was stationary, and remained at 10 per cent. The third-class was still increasing, and now amounted to 85½ per cent. The capital expenditure on lines open, and on new lines and works, during the half-year, had been 540,011*l*.; and 77,211*l*. was required to be expended during the current half-year in additional works for the accommodation of the traffic. The most important items were new platforms, sidings, and stables, the London goods station, and the extension of the passenger station at Nottingham. The accident at the Sutton Bridge Docks, in which the company is largely interested, was referred to by the chairman, who said it was a great disappointment to the directors that the catastrophe had occurred. The docks were hardly finished, and vessels had only just begun to enter the basins and discharge their cargoes or export coal, when the calamity occurred, which they must attribute to the treacherous nature of the soil of the place. A leakage took place under the locks and led to the damage which took place. The company had subscribed 55,000*l*. towards the undertaking, and they had two of the Board representing the company on the Dock Board. They had hardly made up their minds what was to be done regarding the docks. They had a report from several eminent engineers, and they knew pretty well what they recommended, but to carry out their recommendations would entail considerable expense, and at that moment the dock company had no money to expend. On the motion of the chairman, the railway company were empowered to take such steps as they might consider necessary to secure the company's interest in connexion with the docks, and to expend any sum that might be deemed requisite to protect the docks from further injury.

In the *Builder* lately (p. 290, *ante*), the proceedings at the meeting of the *London and North-Western* Company, relating to railway taxation, the falling off in the Irish traffic, the Employers' Liability Act, and some other matters, were noticed. The chairman, in his speech moving the adoption of the report, made some interesting remarks on the new works which had for some time past been in progress on various parts of the company's system, and also drew the attention of the shareholders to the additional expenditure which it is proposed to incur on further new lines and other works. Adverting to the former, he said that the London-road Station at Manchester was now very greatly enlarged, as well as the Lime-street Station at Liverpool. If any one, he observed, would go to Manchester, he would say that the wonder was that they could have gone on with the former station at all. But it was now different. They had also opened for goods the duplicate station at Northampton; and by January he hoped Northampton would have its passenger-station ready, and thus bring in the North-Western line. He did not believe it was the intention of Stephenson to go through Northampton; there was a tradition, too, that the people of Northampton objected to it. He could not have got the line with the present gradients. They had now other advantages by the new line which would go through Northampton. They had put that line on the old main line through Rugby, and on the new main line to Nottingham and the North. The company had now a double line all the way from London to Birmingham, a double road to Northampton, a double road to Crewe, and through to Liverpool, and with the assistance of the North Staffordshire Company, they had two roads to Manchester, and two to Chester, and shorter than any one else. The directors were authorised to expend, in conjunction with the Midland Company, the sum of 820,630*l*. on new lines, including the Market Harborough line; and also 50,000*l*. in the construction of additional lines and sorting sidings at Edge Hill, Liverpool; 35,000*l*. for sidings and improvements at Patricroft, Manchester; 22,000*l*. for sidings at Wolverton; 83,283*l*. for additional sidings and other accommodation; 114,756*l*. for additional land and minerals; 50,000*l*. for additional rolling stock; and 65,000*l*. under the Watford and Rickmansworth Railway Transfer Act,—total, 305,039*l*., being an aggregate expenditure (including the joint expenditure with the Midland Company) of 1,125,669*l*.

The *Great Eastern Company's* report stated that the accounts showed a gross revenue from all sources of 1,424,291*l*., against a gross revenue of 1,398,079*l*. in the corresponding half-year of 1880. The passenger and goods traffic had suffered from the closing of the cattle markets; whilst the severe winter and heavy falls of snow occasioned a considerable increase in the expenditure of the various departments, the

working expenses showing a gross increase of 20,762*l.* Satisfactory progress had been made with the works on the Northern Extension, and the directors hoped that the portion from Spalding to Sleaford would be opened during the present year. Adverting to the enlargement of the Fenchurch-street Station, the chairman said he hoped it would be completed before this time next year. They would then be enabled to get in and out a greater number of trains, and to further accommodate the suburban districts which they supplied. He added that they were about to widen the line from Stratford very nearly to Bethnal-green, by making four lines of rails.

At the meeting of the *London and South-Western Company* the chairman stated that the company had suffered from the great snow-storm and the severe winter, which was felt more severely in the southern and western districts than in the east and north. The severe winter had cost the company 31,000*l.*, and if the directors had had that amount of money to dispose of they would have been able to carry over the same balance as they did in the corresponding period, and to pay the same dividend. There had been a decrease in the revenue during the half-year of 3,025*l.*, and an increase of 28,823*l.* in the expenditure. The dividend declared was at the rate of 4¾ per cent. It was stated that the widening of the line between Clapham Junction and Surbiton would probably be finished in the course of the year, and the line from Surbiton to Hampton Court Junction would take about two years. The new line between Surbiton and Guildford would be shortly commenced. The chairman stated that the important subject of extending the line from Waterloo into the City was receiving careful consideration by the directors, who were making all necessary inquiries with a view to the decision of the question in the interests of the shareholders.

The report of the *London, Chatham, and Dover Company* stated that the gross receipts for the half-year amounted to 530,156*l.*, as compared with 523,583*l.* for the corresponding period of 1880, being an increase of 6,574*l.* The report also stated that the Board proposed to proceed as rapidly as possible with the several new works authorised by the Act of the late session. They include the new bridge over the Thames and the station opposite the *Times* office; the Maidstone and Faversham Junction Railway; a junction to connect the Dover and Deal line with the main line; and two extensions at Greenwich and Sheerness. The works are to be proceeded with in the order of their urgency, the extension at Blackfriars and bridge across the Thames being the first.

At the meeting of the *South-Eastern Company* the chairman stated that the results of the traffic during the half-year had not been satisfactory to his mind. They had received practically 16,295*l.* more money from one source or another, and managed to spend 20,630*l.* to get it. He found that during the last desperate winter they spent 2,168*l.* in clearing away the snow, and they sustained a loss of nearly 10,000*l.* in traffic. As regards the company's new works, it was stated that the West Wickham and Hayes and Hundred of Hoo lines, including the deep-water harbour on the Medway, were making satisfactory progress; the contract for the Woodside and Croydon line had been taken by Mr. Joseph Firbank; and the extension of the North Kent line from Strood to Chatham and the construction of a line from Northfleet to Snodland would shortly be commenced. The chairman announced that the Charing-cross Hotel had now been fully purchased from the hotel company by the railway company.

The report of the *London, Brighton, and South Coast Company* stated that the receipts from traffic for the half-year amounted to 931,222*l.*, as compared with 927,085*l.* in the corresponding period of 1880, showing an increase of 4,137*l.* The Tunbridge Wells and Eastbourne, the Ryde Pier and Railway, and the Chichester and Midhurst lines, had just been opened, and progress was being made with the Lewis and East Grinstead line, the Croxten and Oxted line, and the Newhaven Harbour. Regarding the last-named undertaking the chairman remarked that no doubt they were throwing their bread upon the waters in the hope that it might come back to them another day, and he believed it would. He looked forward to the time when the deep-sea harbour at Newhaven would give them a great deal of continental traffic in different directions.

The traffic receipts on the *North-Eastern line* for the half-year amounted to 3,079,161*l.*, as against 3,115,965*l.* last year, being a slight decrease, but admitting, after expenditure, of a dividend on North Eastern Consols and the New Stock at the rate of 7¼ per cent. per annum. Referring to the traffic in the different classes of carriages, the chairman said that they carried 415 000 first-class passengers, as against 453,000 in 1880. The second-class passenger traffic also showed a continuous decrease. In the last half-year they carried 529,000, against 600,000 in 1880, and 643,000 in 1879. But the third-class traffic continued to increase. There was a steady and regular augmentation of third-class passengers, of whom they carried in the past half-year 12,756,000, as compared with 12,193,000 in 1880, the increase being 563,000, and an increase of no less than a million and a half over 1879. That showed that there was a tendency to travel in a cheaper class of carriage, and, therefore, they had made a considerable reduction in both first and second class fares. They were largely converting first-class into third-class carriages.

The proceedings at the meetings of the *Metropolitan* and *Metropolitan District Companies* were chiefly interesting so far as they referred to the prospect of the early completion of the Inner Circle.

The report of the *North London Company* stated that, notwithstanding the interference with the traffic arising out of the severe weather in the months of January and February last, the receipts of the last half-year showed an increase from all sources of traffic, admitting of a dividend at the rate of 7½ per cent. per annum on the ordinary stock.

The *Lancashire and Yorkshire Company's* report showed the traffic receipts for the half-year to be 1,741,841*l.*, against 1,717,700*l.* in 1880, and a dividend at the rate of 4¼ per cent. per annum was recommended. The amount of capital expended during the half-year was 306,353*l.* and 290,735*l.* would be required for expenditure on new works during the current half-year. The property required for the new Exchange Station in Liverpool had, for the most part, been obtained, and the work would before long be commenced.

It appeared from the proceedings at the meeting of the *North Staffordshire Company* that the line suffered greatly during the winter time from floods. The chairman stated that the Churnet ran down a part of their railway, the Dove ran down another part of the line, and the Trent also ran down another part; so that they were subject to floods from three different sources. These floods were very disastrous, and washed away the ballast on their line, and injured their bridges, rendering necessary a large expenditure in repairs and other works.

A BRIEF CHRONICLE OF NEWGATE.

The prison of Newgate is doomed. Probably before the present year draws to a close the work of its destruction will be commenced.

"B. L., of Twickenham," in "An Accurate Description of Newgate" (London, 1724), writes:—"Newgate, the county gaol of Middlesex, is situated in an elegant part of the west of the city of London, called Newgate-street. This prison was built either in the time of Henry I. or that of King Stephen, but in which there is no certainty; and was then (as it has ever since continued to be) a prison for debtors, felons, &c. About 300 years after the first founding of the prison, it became terribly loathsome; and, therefore, was in the year 1412, rebuilt by the executors of Sir Richard Whittington, in the reign of Henry VI. The architecture of this structure is of the Tuscan order, magnificently built with stone, with great strength and beauty." It was repaired in 1630, and in 1672, after being nearly destroyed in the Great Fire. It received its name from the circumstance of the rooms in the postern over the new or latest built gate of the city being used for the detention of prisoners. In "A History of the Press Yard" (London, 1717), which was one of the three divisions of the prison, the author, who was incarcerated along with certain of the Scottish Rebels in 1715-16, writes:—"This tomb of the living (the Press-yard) was once the Phœnix Inn, by Newgate-street, and being contiguous to the gaol of that name, and very convenient for enlarging the territories of one of its keepers, of tyrannical memory, was added to it in the times of the Usurpation." The gaol was burnt by the rioters in 1780, before the completion of the present building, which was designed by Dance, the architect of the Mansion House, and finished in 1783.

The walls of Newgate during the last 600 years have inclosed a motley multitude of prisoners, famous and infamous. In 1241 several rich Jews were ordered to pay 20,000 marks or to be kept perpetual prisoners in Newgate, and shortly afterwards King Henry sent the sheriffs to the Tower, and fined the City 3,000 marks, for allowing a priest who had killed a prior, a cousin of the queen, to escape from Newgate. In 1457, Lord Egremond, Sir Thomas Percy, and Sir Richard Percy, were committed to Newgate for a fray in the north country with the Earl of Salisbury's sons. The cells of Newgate opened their doors to many of the Puritans. At the Restoration, George Wither, poet and pamphleteer, and George Sackville, poet, *roué*, and Earl of Dorset, occupied cells in Newgate. William Penn, the founder of Pennsylvania, was committed to Newgate for six months for street preaching in 1622; and, in 1703, Daniel Defoe, for having written his treatise "The Shortest Way with Dissenters," was fined, pilloried, and committed to Newgate. It is not necessary to make any selection from the list of criminal offenders of the Jack Sheppard and Jonathan Wild, the Greenacre and Daniel Good class, for mention here.

Geoffrey Chaucer, the poet, is said at one time of his City life to have resided in Newgate, but not as a prisoner. In a black-letter pamphlet entitled "The Discovery of a London Monster, called the Black Dog of Newgate, imprinted at London by G. Eld for Robert Wilson, and to be sold at his shoppe at the new gate of Graye's Inne, 1612," is a representation of one side of the postern of Newgate, a tower with a grated door leading to grated chambers above, from one of which a disconsolate prisoner is gazing through the bars. This rough cut agrees in the main with some of the oldest extant representations of the ancient gate, the "fifth principal," as Stow terms it, in the City wall.

ROADS AND RUIN.

The road question in London is becoming very serious,—more serious than it ever has been. The adoption at one time of Macadam, then of asphalte, and now of wood, and the failure of all in certain instances, have led, and are leading, to constant stoppages of traffic and dire mischief to individuals living in the line of operations. The rapidity with which roads now get out of order is very striking, and the increased length of time during which the traffic is turned in order to do the work is equally obvious. A portion of Piccadilly, for example, between Duke-street and Regent-street, has been blocked up for many weeks, to the inconvenience and great loss of some of the shopkeepers,—a loss, in one case, we are told, likely even to prove disastrous. In other parts of the town we hear of the greatest indifference being shown to the complaints of parties inconvenienced and injured, and that twice the time has been occupied over a work that it should have needed. In the Fulham-road there seems to have been great delay, and one end of Brompton-crescent opening into it has been turned into a stone-yard or depôt for materials for an unnecessarily long period of time. We have in our eye the case of a physician there, to whose house no carriage has been able to approach for many weeks, notwithstanding repeated requests that materials placed there should be removed. We should be surprised, were he to bring an action against Messrs. Nowell & Robson, the contractors for the work, and show the positive injury that has been done, if he did not recover substantial damages.

Under the best arrangements individuals must suffer during the stoppages now so constantly taking place in the highways. It should be the bounden duty of the parish authorities and contractors to minimise this evil to the utmost.

Lightning.—The church of South Wootton, near Lynn, has been struck by lightning. The damage done is serious. The electric fluid struck the tower, splitting it almost in two, and leaving it uncertain whether one portion will not fall and so bring down the rest with it. Then, running along the lead ridge for some dozen yards, it entered through the roof into the nave, where it spread havoc in all directions. Was the church protected by a conductor?

THE "GRESHAM PRESS" NEW BUILDINGS.

The spacious plot of land, bounded on the west by the London, Chatham, and Dover Railway station, in New Bridge-street, and on the north by the buildings on the south side of Ludgate-hill, has recently come into the possession of Messrs. Unwin Brothers, and upon a portion of it they have just erected an extensive printing factory, which will shortly be ready for occupation. The principal elevation is on the north side, fronting the narrow thoroughfare known as Little Bridge-street, which runs in an eastward direction from New Bridge-street through a corner passage or neck not more than from 3 ft. to 4 ft. in width, and thence, intersecting Broadway, is continued along Pilgrim-street and into Ludgate-hill. The Corporation having secured about 10 ft. in width of the land in front of the new buildings, the Little Bridge-street frontage has been set back to that extent, which admits of the present narrow roadway being correspondingly widened. The intention of the Corporation is to open out an uninterrupted thoroughfare for vehicles into Ludgate-hill by way of Pilgrim-street.

The site upon which the new buildings have been erected has an area of about 9,200 superficial feet. The Little Bridge-street frontage, and also that in Railway-street, on the west side, facing the east side or rear of the railway station, are each 90 ft. in length, and 80 ft. in height, the chimney-shaft being carried to a height of 90 ft. In addition to a deep basement and ground floor, the building has four lofty stories. The ground-floor frontage facing Little Bridge-street consists of shops, which the owners intend to let for general business purposes, in anticipation of the opening out of the new thoroughfare already referred to. The shop frontages are carried up with Bath stone columns and pilasters, surmounted by carved capitals. The upper stories are in stock brick, with red brick for dressings and ornamentation in the Queen Anne style. The east end of the frontage is surmounted by a large gable. One of the most ornamental features of the building is the angular elevation at the corner of Little Bridge-street and Railway-street, where is the principal entrance to the premises. The whole of the lower part of this elevation is in stone, with arched entrance flanked on each side with piers and columns in Portland stone. Immediately above the doorway is an oriel window in five divisions, with carving at the base, and the inscription in prominent characters, "Gresham Press." In the centre of the building, enclosed by the respective frontages, there is a large open area for the purpose of affording additional light to the rooms and apartments on the several floors, and also for lighting the basement in which the machinery will be placed. The walls of this open area, as well as the walls of the basement, are faced with white glazed brick, and the basement is covered in with a flat glass roof or skylight, 40 ft. by 20 ft. At the top of the building there is a water-tank, capable of containing 5,000 gallons.

Mr. Rowland Plumbe, of Fitzroy-square, is the architect, and Messrs. Ashby Brothers are the contractors.

FROM GERMANY.

In celebration of the fiftieth anniversary of the Saxon Constitution, the Albrechtsburg at Meissen has been restored, with a due regard to its historic position as one of the ancestral castles of the present royal family. The work of decoration began in 1874, and in the previous year the Chamber of Deputies had voted 25,000*l.* for the restoration. The subjects of the decorations are for the most part taken from the early history of Saxony, and are in part illustrative of the building of the castle in 930. The edifice has two vaulted stories underground, and three above ground. The attention of the decorative artists has mainly been given to the first and second floors, but the third has also been suitably treated, and the ground-floor has been arranged for habitation. The armoury (which is a richly-designed piece of architecture) has been ornamented with representations of seven of the oldest Saxon and Thuringian castles. The tower, and some subsidiary buildings connected with the castle, have likewise been restored. The statue of Albrecht (the founder), cast in bronze, forms a prominent object of interest. The building was open to public inspection during the work, and last year was visited by more than 20,000 persons. A costume festival will shortly be given in the castle by a number of artistic inhabitants of Dresden.

The municipal chamber at Hamburg has lately received an important addition to its artistic ornament, in the shape of stained-glass windows, the execution of which (by local artists) seems to have given much satisfaction. The subjects represented are connected with the development of the freedom of Hamburg. The solemn and subdued effect produced by the stained glass is much approved by the press.

A vessel, described as the largest yet built in Germany for the mercantile navy, has just been launched at Kiel. It is a screw-steamer, 315 ft. in length and 37 ft. 9 in. in breadth, with a carrying capacity of 3,300 tons, and with accommodation for over 700 passengers. It has been named the *Cassius*, and will, as soon as the machinery is completed, be put on the New York line.

The *Baugewerbe Zeitung* of Berlin calls attention to the fact that speculation has brought building sites in that city to such a range of values that it is impossible to reckon upon a clear four per cent. interest for the builders, even if the cheapest materials and labour are used. It recommends caution to all employed in the selection of building sites; predicting that this movement will before long be followed by a reaction, which will remedy the exceptionally disadvantageous circumstances referred to.

A deputation from the marble industry of Cologne has waited on the German Government with a view to soliciting the abrogation of the import duty (equal to 1s. 6d. per cwt.) on sawn marble slabs, which is now being levied. The trade is not so much opposed to the imposition of the duty in itself, but to its unequal working, as the duty on marble goods, being about the same, an important development of imports has taken place, to the detriment of native industry. The Government lately asked for the opinion of some members of the marble trade, but the authorities are accused of having addressed themselves only to persons known to be in favour of the new tariff.

The Municipal Lighting Committee of Berlin has called attention to the comparatively-limited consumption of gas in that city, which the report attributes to the continued unfavourable position of business in general. The increased use of petroleum is said also to have contributed to this result; and as many as 11,000 gas communications are said to be unused at present, which would represent about one-fifth of the communications for dwelling-houses in Berlin.

THE OPEN AREA OF THE ROYAL EXCHANGE.

Our attention has been called by several correspondents to a design for covering in the Merchants' Area of the Royal Exchange, now being exhibited in the Area, of course with the sanction of the Gresham Committee. We do not know exactly the position of affairs, but we cannot avoid expressing an earnest hope that no intention exists to carry out this design. It is wonderfully ugly, unsuitable, oppressive, and altogether objectionable.

Some time ago the committee invited designs for effecting this object, and the first premium was then given to a design by Mr. F. Sang. We happen to have a small photograph of this before us, and have no hesitation in saying that it is immeasurably superior in appearance to the design now placed before the public. It is to be hoped that watchful eyes will be kept upon the matter.

Bedstone.—The workmen, 130 in number, employed by Messrs. W. Cubitt & Co. in the erection of the new mansion at Bedstone, for Sir H. W. Ripley, bart., have been entertained by him at a substantial dinner, Mr. W. C. Carter, the managing foreman, in the chair, and Mr. Marton in the vice-chair. It was stated in the course of the proceedings that the founder of the feast (who was present) had for the past twenty-five years spent from 25,000*l.* to 30,000*l.* annually in buildings. Mr. Old, the clerk of works, responded to the toast of "The Architect" (Mr. Harris), and proposed health and prosperity to the firm of Cubitt & Co., saying that if all contractors did their work as well as Messrs. Cubitt, there would be less vigilance necessary on the part of clerks of works.

ENGLISH RESIDENCE, ARCACHON, FRANCE.

A HOUSE ON THE SAND.

Arcachon, as many of our readers know, is a small town in the pine forest thirty-five miles south-west of Bordeaux, on a little inland sea called the "Bassin d'Arcachon," an offshoot of the Bay of Biscay, where a great many English reside during the winter months. This is the first English villa erected there, and is built on the sand in the midst of the pine-trees which extend from Bordeaux to Bayonne, a distance of 100 miles. It may be added that in this sand (which, in some places, is 100 ft. deep) they had to excavate several mètres before securing a sound foundation for footings. This difficulty being overcome, the walls were then carried up battered on the outside from a mètre thick at footings to thirty-five centimètres (1 ft. 2 in.) at plinth level, and then proceeded with in the ordinary way. In some places retaining walls were necessary to keep up the sand, the pressure being very great, especially after rain, when it is apt to slip a little.

The sand is fine and light coloured, rendering it useful for building purposes, and that which was excavated was used for the mortar. The house is built of red brick (*brique de Nercam*) with a white flat joint, and white stone dressings (*pierre de Nersac*) with black pointing, that below the plinth being random work, also pointed in black.

The roof is of slate, and made to overhang some 5 ft. in order to shade the house from the sun, which has great power there. Great care has been taken in carrying out Messrs. Drysdale and S. W. Hayward's Patent System of Warming and Ventilating, but owing to the plan being of an irregular shape, it was a somewhat difficult task to procure a straight and convenient passage for the foul-air flue, so as to render it easy of access at any time for repairs, if necessary.

The architect was Mr. George Fred. Haines, of Boscombe-road, Shepherd's-bush. The works were executed by M. Blavey, contractor, and M. Martin, carpenter, of Arcachon, a great many things being provided by English firms: Messrs. Steel & Garland, Sheffield, providing the grates; Messrs. Minton Hollins and Messrs. Maw & Co. providing tiles for the grate cheeks, hearths, &c.; Mr. Geo. Jennings's patent w.c. apparatus being used, and wooden sinks for scullery and butler's pantry, with hot and cold service laid on throughout the house. Credit is due to Mr. H. J. Ellison, builder, Bournemouth, by whom the pine doors and windows were worked and fixed, as also the oak chimney-pieces from the designs of the architect.

A VICTORY OVER SEWER GAS.

Sir,—1. For more than seven years I have been watching the progress made in house sanitation, and I have passed through many experiences. I will not give those at Birmingham and Manchester, where the local administration is prompt and effective, or at Hampstead, but confine my observations to Philbeach Gardens, near Earls-court, where, influenced by the excellent and very advanced sanitary arrangements which have been matured, I have bought a house. I send you plans of them,* and will relate by what steps of evolution the success has been obtained.

2. On the 30th of June, 1880, I took No. 106, Philbeach Gardens, S.W., on a short lease, on trial, of Mr. Mineard, the builder, on the condition that there should be no escape of sewer gas into the house. The house was like others built on the estate some three or four years ago, with a syphon trap under the coal-cellar, and the soil-pipe continued open up to the roof.

3. At this time Mr. Mineard was building other houses on the estate, in which he had introduced an intercepting-chamber between the main sewer and the house drainage, as well as a ventilating-channel at the adjacent wall. Accordingly, the first thing Mr. Mineard did was to fit up my house similarly to others he was then building, with an intercepting and inspection-chamber, and with an inlet for fresh air through one of Boyle's ventilators in the front area. I found Mr. Mineard unusually interested in the progress of house sanitation, and well acquainted with what his brother builders were doing, and

* The details on Plate 2 are drawn rather less than one-fifth of full size.

the many systems which sanitary surveyors were recommending. I was by no means perfectly satisfied that traps of any kind could be relied upon as absolute preventives, and I objected to using the stack or soil-pipe for upward ventilation, which is commonly done, and was done in my house. I urged the necessity of an independent upward draught, which I had insisted upon having introduced into my last residence at Hampstead.

4. Mr. Mineard himself admitted that the best systems then in use were not, in his opinion, satisfactory, but contended that it would not do for a builder to be endeavouring to excel in sanitary work; because whatever he might accomplish in that direction was likely to be much criticised, and, perhaps, unfavourably, by the self-styled sanitary engineers, who might happen to be called in to report on his houses, especially if it differed at all from the engineers' own pet plan. He expressed an opinion that he could do something better than anything then in use, and asked me to allow experiments to be made on my house, to which I cheerfully consented.

5. He proceeded to close up the inlet ventilator to the intercepting-chamber, and connected therewith instead an outlet ventilating shaft of wrought iron, carried above the roof of the house, with a small heating-chamber about 5 ft. above level of area, trying experiments with gas and various kinds of burners, atmospheric and otherwise, and his success from the first was complete. More gas at first was used than was necessary. The results now prove that about 2 ft. consumption of gas per hour is ample to draw down the air which passes down the soil-pipe, then through house-drains and up the extracting shaft.

6. The gas was first applied to No. 106, Philbeach-gardens, in the early part of February, 1881, and Mr. Mineard took out his patent on the 15th of April, 1881.

7. While I write this, the following facts have been registered at the south aspect of my present house, 96, Philbeach-gardens:—

1st. With both w.c.'s closed, the length of pipe from inlet on top of soil-pipe to top of extracting shaft is about 160 ft., and the air passes through the anemometer at the rate of 384 ft. per minute.

2nd. When the upper w.c. is open, which, acting as inlet to soil-pipe, reduces the length of pipe to 140 ft., air passes through at the rate of 422 ft. per minute.

3rd. When the lower w.c. is open, reducing length of pipe to 115 ft., air passes through at 440 ft. per minute.

8. These facts were obtained on 16th September, 1881, at 3 to 3.30 p.m. The day was fine, little air stirring. The sun shone on the front of the house and helped the extraction.

9. The simple effect of these arrangements, which can be demonstrated to any one, has been to produce an *upward* draught so potent that the *downward* draught in all parts of it extinguished a lighted match; and so the problem of giving absolute security against the possibility of sewer gas entering a house was thus solved.

10. The cost of the gas I estimate to be about 1s. per week, which I consider a cheap insurance against typhoid fever.

11. Whilst the work described in No. 106 was going on, Mr. Mineard was erecting further houses ten doors off. These, in general arrangement, were greatly improved. The highest authority on practical sanitation said my present house was "the largest on the smallest space he had ever seen." Upon Mr. Mineard agreeing to introduce some suggestions which I made, I bought one of them, No. 96, and I now invite my friends to come and see it, and criticise it. It exhibits:—

I. Plenty of light—an antidote to dirt and sluttishness.

II. Good ventilation generally, and special means for preventing the usual escape of kitchen odours in the passages of London houses.

III. Absolute extraction of all sewer gases and smells by Mineard's patented sanitary arrangements.

IV. Security against frozen water-pipes and water in cisterns.

V. Heating in passage at no cost for working.

VI. A labour-saving lift from kitchen which also insures hot viands and plates.

12. Mr. Mineard has reaped his reward for his intelligent attention to sanitary science, and the practical application of it. He sells his houses with these sanitary features at increased profit before the houses are completed; and since the first experiment was made, has introduced them into all the houses he has built, and is now building.

13. His patent for the application of this system of extracting sewer-gas covers, also, any method of heating, and I have no doubt he will devise a means of cheapening the heating.

14. The result he has now arrived at, by slow but progressive and sure steps, has been the work of four years; and I believe he is only at the threshold of further successes, and that his system will be found applicable at little cost to houses smaller than the one I live in. The plans sufficiently explain themselves without further observations. HENRY COLE.

PRINCIPAL FAÇADE, CADIZ CATHEDRAL.

IT would be in vain to search in the comparatively modern edifice of Cadiz Cathedral for records of the great traditions impressed upon the Gothic pillars of other churches of Spain. The written history of Cadiz Cathedral can scarcely be traced; but, in its place, the building itself is valuable as an artistic work, and a silent testimony to the religious fervour of the people and to the perseverance of Bishop Don Fr. Domingo de Silos Moreno, whose statue, in bronze, was erected in the cathedral square by the municipality in 1856. The foundation-stone of the church was laid on May 3, 1722, during the episcopacy of Don Lorenzo Armengual de la Motá; and the work was commenced under the direction, and according to the plans, of the architect, Don Vicente Acero. Want of funds, however, caused the work to be stopped, and for almost a century nothing was done, the completed portion in the meantime greatly deteriorating. In 1832, when a fire broke out amongst the timber stored in one of the chapels, Silos Morenzo, the bishop at that time, succeeded in stirring up public feeling in the matter, and mainly by his exertions the building was completed, so that he had the satisfaction of consecrating it on November 28, 1838. The sums spent in the construction of the cathedral up to that time amounted to twenty-six million reales.

The interior of the church consists of nave, aisles, and fourteen chapels, and is richly decorated with marble and jasper. The nave measures 279 ft. in length and 44 ft. 6 in. in width; the aisles are 25 ft. wide. Its greatest height, from the pavement to the roof, is 173 ft. The façade has an elevation of 68 ft. 6 in., and has three entrances. It is flanked by two octagon towers of a height of 189 ft., and a diameter of 44 ft. These towers were erected under the direction of the architect, Don Juan de la Vega; the eastern tower was finished in 1846, the western in 1862. The columns of the façade are partly of the Ionic, partly of the Corinthian order. Two niches in the façade contain the statues of St. Servando and St. Germano, the patrons of the city, and possessing some claims to antiquity. They were saved from the ancient cathedral of Cadiz, which was burnt down at the time of the English expedition against the city in 1596. They found a place in a new building, still known as the old cathedral (*catedral vieja*), and now used in connexion with the present cathedral.

We cannot attempt to describe the building in detail, but may mention a few of the more salient features. The abundance of marble amounts to prodigality, yet without exceeding the bounds of good taste. Visitors are further struck by the elegance and grace of the presbyterium, the excellent execution of the pavement, and the handsome choir-seats, the work of the famous carver, Pedro Duque Cornejo, and which formerly belonged to the Carthusians of Santa Maria de las Cuevas of Seville. These seats were placed in the cathedral in 1859. The choir screen also deserves mention, as well as the magnificent tabernacle, finished in 1866, and in which is preserved a valuable bronze ciborium. There is also a richly-chased silver chalice here, the work of Antonio Suarez (1664).

A Useful Machine.—The *Cambridge Chronicle* says that Mr. G. Hamit, engineer to the Haddenham Drainage Commissioners, has invented a machine for cutting weeds, or what is commonly called roading rivers, drains, and watercourses. The adoption of this new machine will reduce the cost of "roading" by at least one-half, besides doing the work in a quicker and superior manner. It cuts the weeds and collects them in heaps for the men to gather.

CHURCHER'S COLLEGE, PETERSFIELD, HANTS.

THE Governors of Churcher's College having invited six architects to submit designs in competition for the new College buildings, received the drawings in December, 1877, and submitted them to Mr. Ewan Christian, the architect to the Ecclesiastical Commissioners, to report on their respective merits. In accordance with that report, the design marked "Thoro," submitted by Mr. G. R. Crickmay, of 17, Parliament-street, Westminster, was chosen, and, with slight modifications, has been carried out under his superintendence. The present commodious and substantial building is the result.

The college has been planned in accordance with the modern requirements of a public school. We understand that the building has undergone a critical scrutiny by several experienced masters of public schools, who expressed their approval of the arrangements.

The building is planned with the head master's house at the south-west corner; the kitchen and matron's department at the north-west corner; and the school running eastward from between the two.

The school is arranged with rooms on each side of a corridor, and consists of a spacious dining-hall, library and committee-room, assistant master's sitting-room, class-rooms, and at the extreme east end a large and lofty school-room; and on the floors over are the dormitories for the boys, the assistant masters' bed-rooms, lavatories, bath-rooms, wardrobe-room, &c. The head master's house consists of three sitting-rooms, seven bed-rooms, dressing-room, and domestic offices, and although entirely shut off from the school, it is in such close proximity that he has the complete control of the school, dormitories, and matron's department. The matron's department consists of the kitchen, scullery, and offices, her own sitting-room and bed-room, and the servants' hall and bed-room. The kitchen is connected with the dining-hall by a pantry and servery.

Accommodation has been provided for fifty boarders and 100 day-boys, and provision has been made for future extension, the kitchen and matron's department having been constructed sufficiently large to meet the requirements of a larger school.

It is proposed to erect a gymnasium and fives-court, and a laundry is provided on the east side of the educational block.

The building has hollow walls, and is faced with Godalming Bargate stone with Box-ground stone dressings, the roof being covered with Hamworthy Junction plain tiles, the whole forming a picturesque group. The staircase and corridors are fire-proof. The floors of school-room, class-rooms, dining-hall, and library, are formed of wooden blocks laid herringbone-wise. Open fireplaces have been provided throughout, and Capt. Galton's ventilating grates are used in the dining-hall, library, school, and class-rooms. The principal rooms are finished with trowelled stucco for paint, and with Parian cement dado. Considerable attention is said to have been given to the sanitary state of the premises, and in no case does a drain connect with the school buildings. The premises are supplied with water, and gas has been laid on throughout. The gardens, cricket, and recreation-grounds are about ten acres in extent, and the surrounding country is very picturesque.

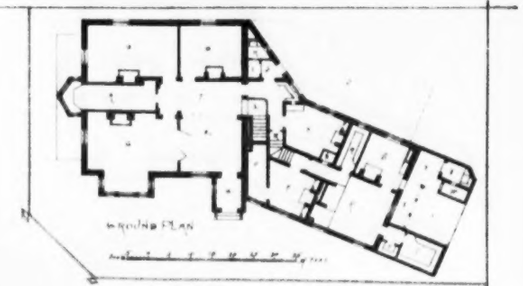
The buildings have been erected at a cost of something over 10,000*l.* by Mr. John Crook, of Southampton, Mr. Hawkins being the clerk of the works. Messrs. Lankester & Son, of Southampton, were the contractors for the gas, bell-hanging, and hot-water work.

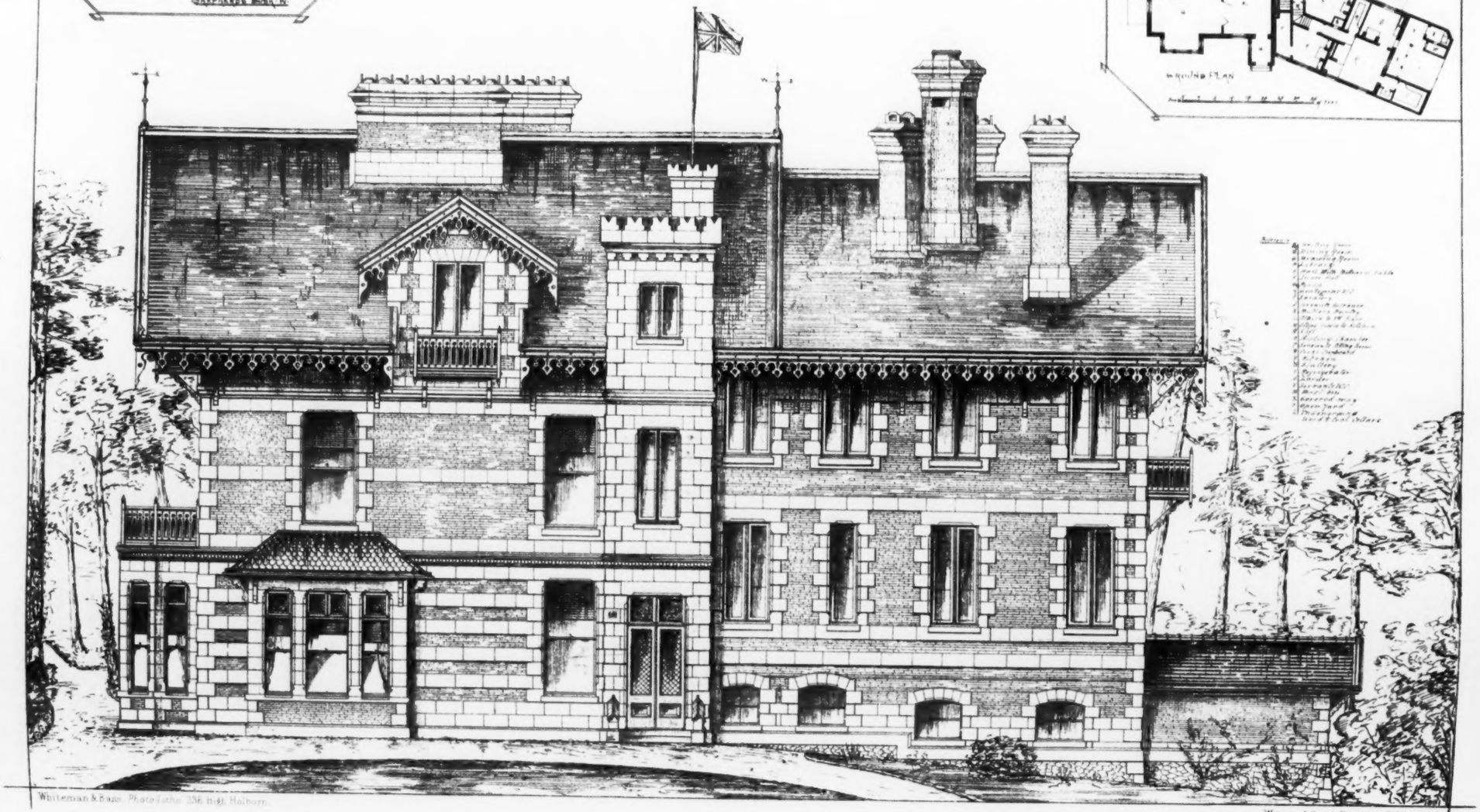
Practical Christianity. — Archdeacon Denison has circulated in Brent Knoll, in Somerset, a paper setting forth the extent to which he has, during the last quarter of a century, supplied the district with water. Finding that epidemic disease prevailed for want of water, he dug for wells, and has now ten reservoirs, four springs, and eight dams with fountains, filter-beds, tanks, and pumps. The drinking-water is supplied through galvanised pipe directly from the springs. The six lower reservoirs are fishpools, pools for swans and ducks, and drinking-places for cattle. The Archdeacon has spent 1,500*l.* on the works, and he now calls upon the people to take up the matter themselves.

ENGLISH VILLA

ARCACHON · FRANCE.

GEORGE FREDERICK HAINES · ARCHITECT
2 BOSCOMBE ROAD
SHEPHERD'S BUSH, W.





Whiteman & Bazo, Photo-Litho, 256 High Holborn.

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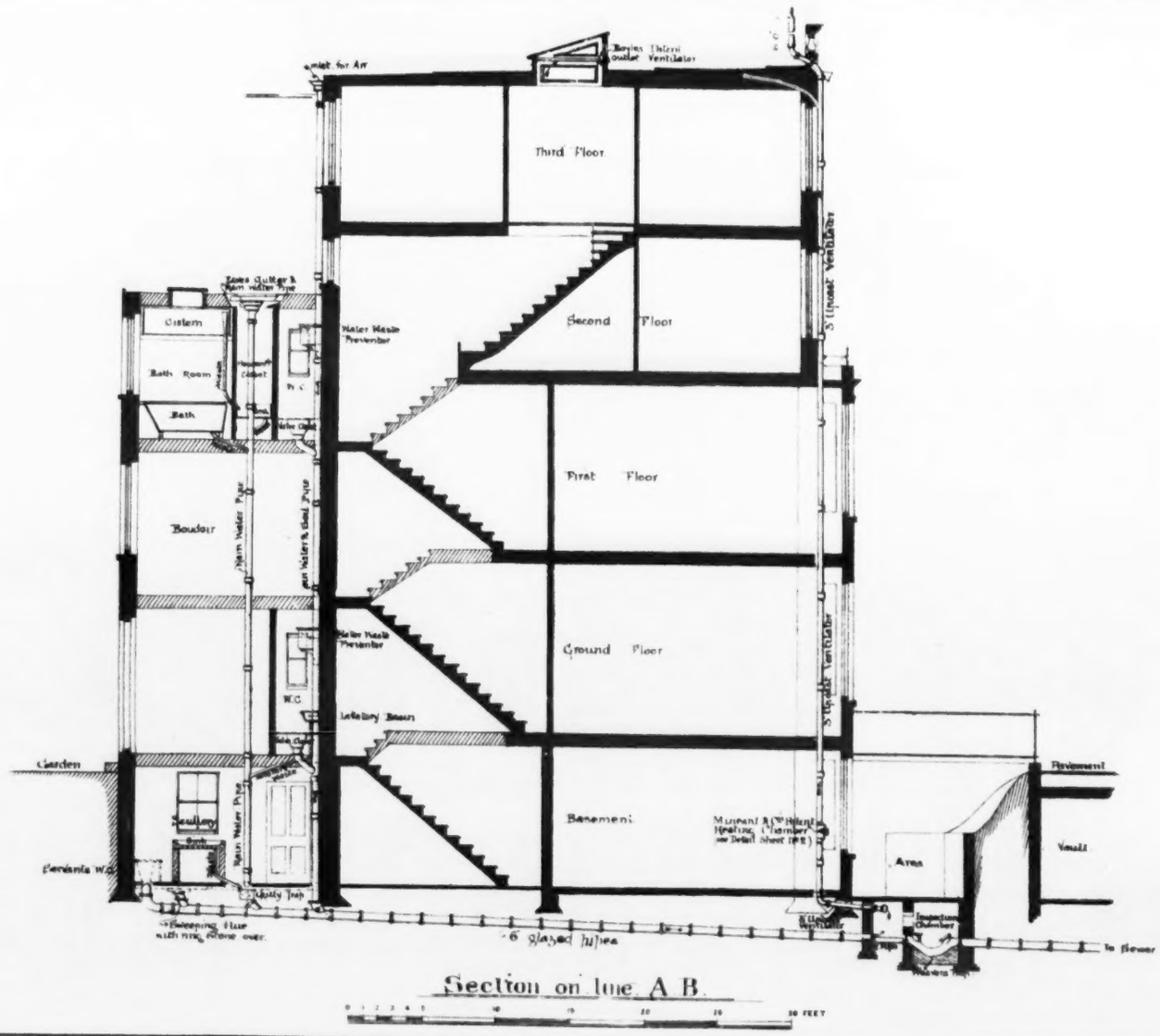
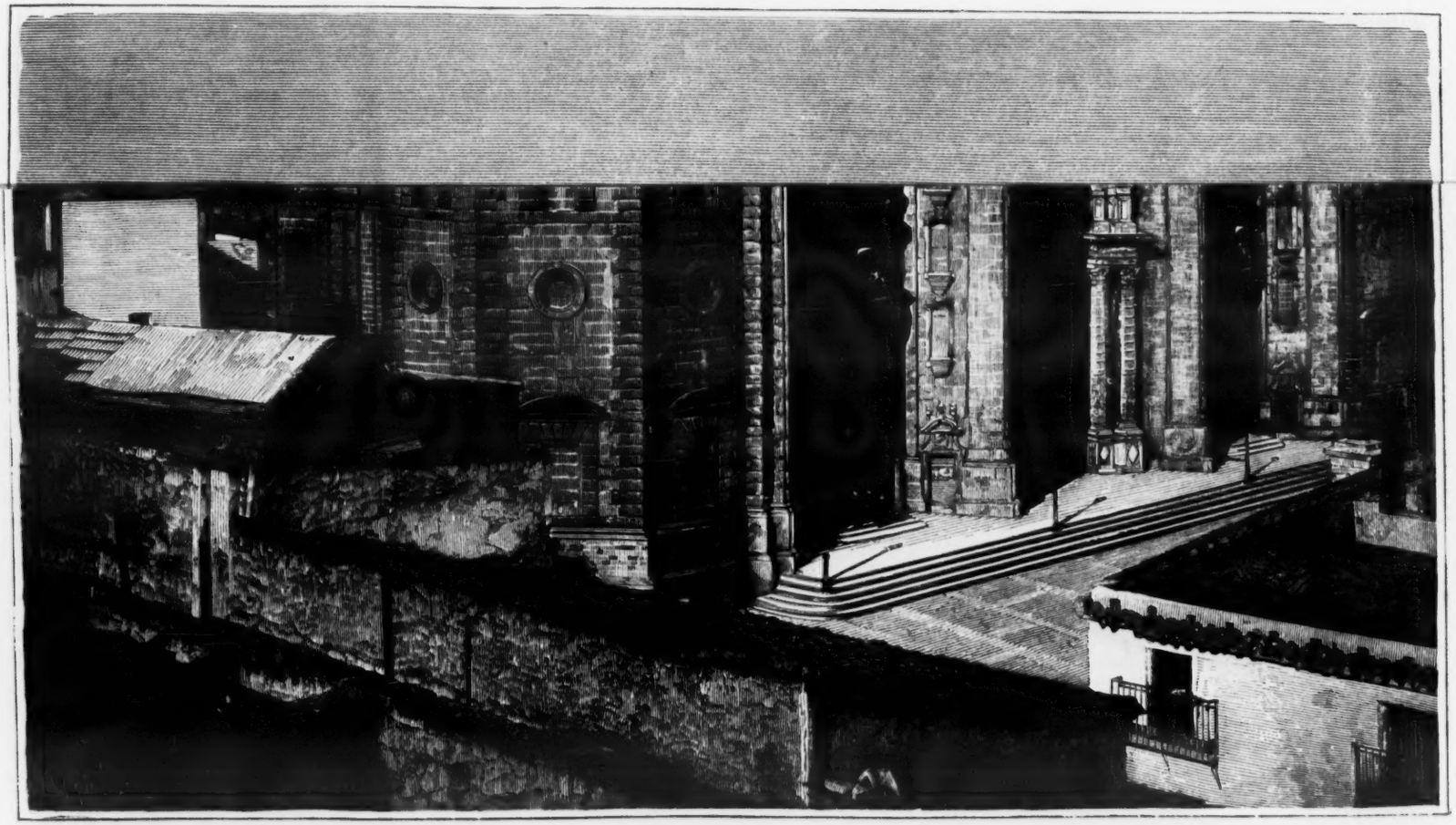


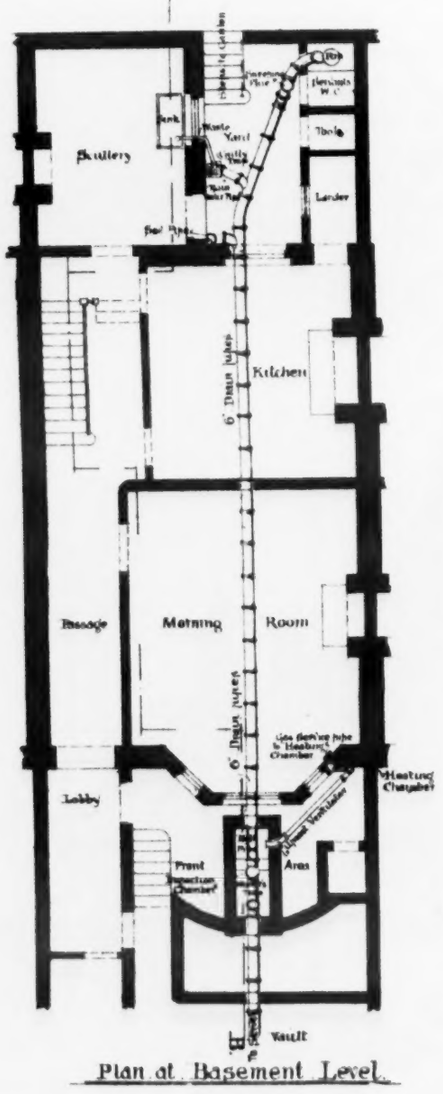
PLANS OF SANITARY ARRANGEMENTS TO HOUSES, WARWICK ROAD AND PHILBEACH GARDENS, KENSINGTON.



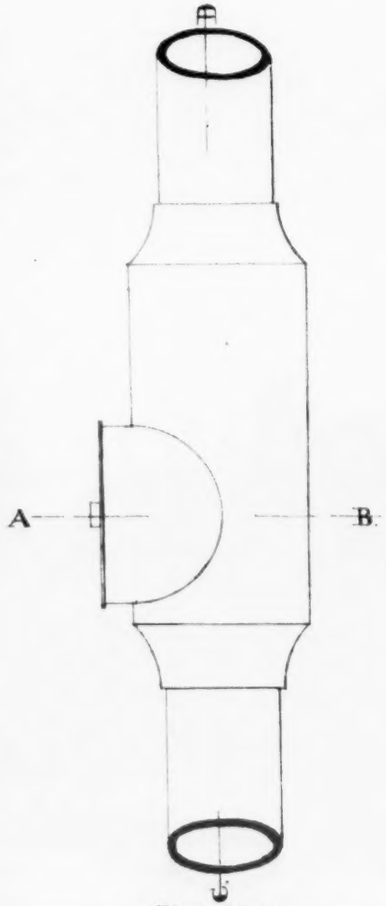
PRINCIPAL FAÇADE OF CADIZ CATHEDRAL.—Don Vicente Acero, and Don Juan de la Vega, Architects.

PRINCIPAL FAÇADE OF CADIZ CATHEDRAL.—Don Vicente Acero, and Don Juan de la Vega, Architects.

No. 2.

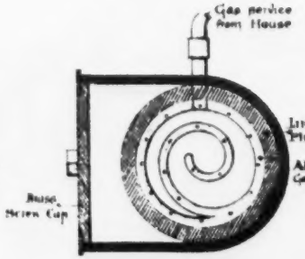


Plan at Basement Level.

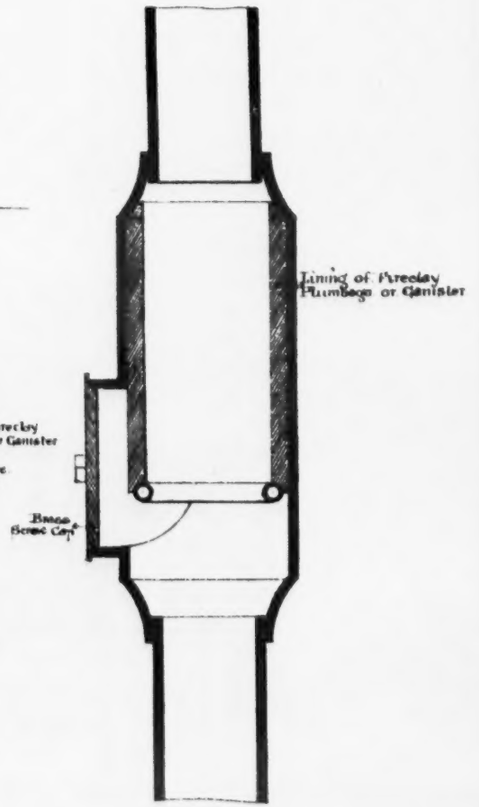


Elevation.

Detail of Heating Chamber on Upcast Ventilating Pipe.



Plan on line A B



Vertical Section on line C. D.

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CHURCHERS COLLEGE : PETERSFIELD . HANTS :

IMPROVEMENTS AT SOUTHPORT.

NEW MARKETS AND PROMENADE.

On the 7th ult. the new markets in Southport,—perhaps the most progressive of watering-places,—were opened by the Earl of Derby. The markets, situated in Eastbank-street, have been erected in the Italian style of architecture, from the designs and under the superintendence of Messrs. Mellor & Sutton, architects, London-street, Southport, Mr. Leigh Heyward being the clerk of works, and are bounded by streets on three sides, with thirteen entrances therefrom, the centre entrance to Eastbank-street having pilasters and columns, supporting figures of Flora and Ceres. Over this entrance will be a clock, to be seen from both the inside and outside of the building, and on the top of the pediment a group of sculptured figures. Surmounting behind is a large octagonal dome, covered with zinc, of fish-scale pattern. The central entrance in King-street is surmounted by a bell-turret, supported by Tuscan columns, pilasters, &c. All the details have been carried out in a bold manner, suitable to the general character of the building, and the whole of the three elevations are faced with Longridge stone. The market is spanned by five bays of principals supported on iron columns and lattice girders, well lighted from lantern-lights in the centre of each bay, arranged so as to exclude the sun's rays as much as possible from the area of the market. The inside of the market is divided into three parts, that for the poulterers, butchers, provision dealers, and greengrocers occupying an area of about 2,660 square yards, the greengrocers occupying the centre, their stalls being in eight blocks of four each, so as to give them a fair chance of equal patronage by each occupying a corner. Cold water is laid on at two points in each block, with standpipe and tap, and sink under. The butchers, poulterers, &c., are ranged round the sides in thirty-five stalls, each having water supply, small stove for cooking, &c. The walls are lined with glazed white bricks to 5 ft. high; the provision stalls have revolving shutters; and the floor of the stalls throughout, with the exception of the greengrocers', are laid with wooden blocks on a bed of cement. The fish-market occupies an area of 719 square yards, and contains twenty-seven stalls, fitted with earthenware sinks, with water supply over the same, and grid underneath, marble fish slabs, small stove, &c. The wholesale portion of the market, which is at the rear of the fish-market, and can be entered therefrom by two doors, or from the butchers' stalls, or from Market-street, contains an area of 824 square yards. The inspectors' office is placed here, and is in two stages. In his office will be the large gas-meter, and he will have control of the weighing-machine, which is placed in Market-street, and is overlooked from his office. Close to this office is a stand-pipe and tap for hot water, to supply the butchers, &c., with hot water for washing purposes. The market-yard is in connexion with the wholesale market, and contains receptacles for fish and vegetable refuse, boiler-houses, &c., and cart-entrance from Queen Anne-street. There is a basement story under the whole of the market for storage purposes. It is approached by an inclined way adjoining the market-yard, and by steps from King-street. The whole of the works have been carried out in a creditable manner by Messrs. Bridge & Son, of Southport and Burscough. The building has cost about 25,000*l*., and the freehold (which was bought in 1876) cost about 15,000*l*. An Act empowering the Corporation to proceed with the work, and borrow 50,000*l*. for it, was obtained in 1876. It will, perhaps, be remembered that about four years ago, when the Corporation offered a premium of 100*l*. for the best plan for a new market to suit the site, subject to certain conditions, a controversy arose on the subject of the selection of the plan. Three plans were chosen out of twenty-five designs sent in, but as the committee could not agree upon the merits of the three, they were submitted to Mr. Waterhouse, upon whose decision was to rest the award of first, second, and third premiums. Mr. Waterhouse awarded the first premium to a design by Messrs. Coe & Jackson, of London, the second to Messrs. Bell & Roper, and the third to Messrs. Mellor & Sutton, a local firm. With this decision certain members of the Markets Committee were not satisfied, and a meeting of that committee was held to decide the question. At this meeting (says the *Liverpool Post*) Mr. Alderman Sutton (the present mayor and a brother to the local architect) presided, and it was by his casting vote that the design selected as first by Mr. Waterhouse was discarded in favour of the design of Messrs. Mellor & Sutton. This led at the time to much severe comment in the local press of an exceedingly personal character, and although public opinion seemed to discover in this vote of the committee a prejudice which was not altogether the outcome of purely artistic yearnings, the local plan was sanctioned by the Council and triumphantly proceeded with. The committee was of opinion that the Mellor & Sutton plan, "with a few modifications," would meet the essential points defined by Mr. Waterhouse in his report, and recommended that that firm should be "called in." The amount originally intended to be laid out in the structure was 15,000*l*. Among the "instructions to architects" in the competitive designs issued by the committee, was one distinctly stating that "the total cost, including architect's commission, must not exceed 15,000*l*." The present market has, we are informed, cost upwards of 10,000*l*. more than that amount.

The New Promenade.—The new Marine Promenade, being an extension northward of the Promenade as it existed in 1879, was opened on the same day by the Earl of Lathom. The ground upon which the new promenade is formed cost 8,000*l*., and the contract for its reclamation, including the formation and paving of road and footways, amounted to nearly 32,000*l*., the contractors being Messrs. Gripper & Baylis, of London, who have occupied about two years in the work. Forty-eight acres have thus been reclaimed and built up as a continuation of the promenade, which now extends close up to Hesketh Park, the entire promenade being about a mile and a half in length, of which the extension is three-quarters of a mile. The whole of the work has been carried out from the plans and under the supervision of Mr. William Crabtree, the Borough Surveyor, who has prepared a plan showing how the land reclaimed may be made to afford sites for 144 villa residences, all detached.

The "Palace Hydropathic and Spa Hotel."—A new wing to this establishment was opened on the 9th ult. Mr. Littlewood, of the firm of Mangnall & Littlewoods, architects, Manchester, before commencing the designs, visited the most noted hydropathic institutions at home and abroad, and as, we are told, has concentrated all their several excellences in the Palace Hotel. The exterior, which is in harmony with the general character of the old building, is picturesque, the sky-line being well broken up. The wing communicates with the main edifice by means of a wide corridor, from which access is gained to the new dining-room. Beyond this is the recreation-room, a large apartment, with an ornamental coved ceiling, and pilasters of composite design, dividing the wall into panels. This room will be used for concerts, amateur theatricals, and other amusements. At the end of the corridor is a door giving access to a second corridor, lighted from above by means of coloured glass, and perfectly ventilated. The walls are decorated with a dado of tiles, of artistic design. Leading off from this passage are gentlemen's baths, of all kinds, all of marble. To each bath two dressing-rooms are attached. At the end of the corridor is the Turkish bath, a lofty room terminating at one end with an apse, into which stained-glass lights are introduced. Attached to this bath are dressing-rooms and a smoking-room. The ladies' baths, which are similar in style to the gentlemen's, are reached from a corridor on the opposite side of the wing. The baths have been erected under the personal superintendence of the architects. They are approached by the principal drive, but have an entirely distinct entrance of their own. The recreation-room is one of the largest rooms of the kind in the kingdom. It is 80 ft. long, 40 ft. wide, and 25 ft. high. Turkish, salt-water, medicated, electro-magnetic, shampooing, and douche baths, and an inhaling-room, are included in the accommodation provided.

The Baths of Agrippa Unearthed.—The excavations undertaken for isolating the Pantheon have laid bare in the Via Della Palombella the baths of Agrippa. The floor, some six mètres below the level of the street, is strewn with fragments of cipollino marble. The base of a column of the same material, fluted only on one side, and a mètre in diameter, is also visible. An immense fragment of cornice, which surmounted it, has just been unearthed.—*Daily News.*

POLITICS AND THE TRADE UNIONS CONGRESS.

Sir,—Surely the almost exclusively political character of the proceedings of the Trade Unions Congress is greatly to be regretted. It is not easy always to draw the line between those considerations which may affect the welfare of any particular trade, or, indeed, of any collection of trades, and those which refer to the political institutions of the country. But it should be remembered that there is a very great contrast in the conditions under which the two categories of subjects can be approached in any such meetings as those referred to. As to the welfare of a trade, regarded as a guild, or fraternal association of masters, journeymen, and apprentices, or anything approaching that ancient and honourable order, the members have special information. Each class or grade in such a trade knows what affects itself most readily, and it may be of common service to hold such a parliament of trades as shall bring this special information under full and intelligent discussion.

With regard to political discussion, on the other hand, there is no subject which demands such broad and accurate knowledge rightly to approach. It is not a matter as to which knowledge is instinctive, or which the special experience of an individual, or of a small class of individuals, has any but an infinitesimal value. Politics is one of the most difficult, as it is one of the most important, of human sciences, and it is only as a science that it can be studied or approached with advantage. The idea that the reference to a few axioms or supposed necessary truths, joined to some fluency of speech, and a good deal of earnestness of purpose, is enough to make a man a politician, is not only false, but mischievous. To be able to form any clear and correct opinion on a political question requires a large amount of accurate and well-based historical knowledge. The leading problems in politics are few. They were discussed by the highest human intelligences, under the most favourable circumstances, two thousand years ago, and though conditions have since then widely changed, principles remain the same. For any man to be able to form an opinion that is worth two straws on any question of politics, in the higher sense of the term, he must know, first,—what are the elements of the great political problems; and secondly, how the relation of those elements has been illustrated by the whole course of ancient and modern history. To historic knowledge down to the present day must be added a considerable amount of statistical knowledge. And all this must be guided by practical acquaintance with the laws of thought and with the nature of logical sequence.

A fit education, therefore, for a political speaker is hardly possible out of those classes in which a certain degree of affluence admits of the devotion of a considerable number of years to the acquisition of a very sound education. Among those young men who are training to compete for the daily more difficult entry to the Civil Service, the Bar, the Church, the Army, the Medical, Architectural, or Engineering professions, there are few who have ever an hour to spare for the systematic study of politics. The exigencies of competitive examination are daily narrowing, and, in my opinion, impairing, the education of the more educated youth of England. And as to those who have to go early in their teens to the plough, the loom, the forge, or the shop, any education in one of the highest branches of human study is entirely out of the question. What is the result of the discussion of such a subject as the effect of vaccination by men ignorant of the very rudiments of physiology, of pathology, or of therapeutics? What ideas of the movement of the heavenly bodies can be formed by persons wholly ignorant of geometry, and of the special branch of trigonometry? What idea of the art of war can be formed by a man who has never seen a more orderly muster than that of a flock of sheep or a drove of pigs? Knowledge, it must be remembered, is only to be attained by hard, patient, and unintermitting study. The higher grades of knowledge are only to be attained by those who have patiently and faithfully passed through the lower grades.

For this reason all such counsels as tend to divert the studies and the energies of any class of men to matters which their education has not fitted them to grasp, and for the mastery of which they have neither the leisure

nor the preparation, must be regarded as mischievous. Nor can it be helped if this opinion seems to bear as hardly on certain discussions in Westminster as in yet more recent debates in St. Andrew's Hall.

An Old Hand.

SAFETY IN RAILWAY TRAVELLING.

Continuous foot-boards, door-locks for carriages, and other appliances intended to ensure safety in railway travelling, were discussed in a paper read by Mr. R. Pickwell before the Mechanical Section of the British Association. The author referred to the importance attached by the Board of Trade to continuous foot-boards, &c., and other means of reducing the possibility of accidents occurring. After giving statistics as to the number of passengers killed and injured by falling between trains and platforms, or in attempting to enter or alight from trains in motion, and the compensation paid for personal injuries, the author explained the working of an appliance connected with a railway carriage door on view in the room, his description being as follows:—The machinery and automatic arrangements attached to the carriages are so arranged that the carriage-doors are no longer entirely in the hands of the passengers, but under the absolute control of either the engine-driver or the guard, and operate as follows:—When a train is standing at a station platform, and taking in or setting down passengers, all the carriage-doors are released, and can be opened and closed at pleasure, as is the case with the existing carriages, and no difference can be observed between the patent and the existing carriage-doors; but the dangerous space between the foot-boards and the station platform (usually a few inches), and which the Board of Trade call special attention to, is bridged over throughout the length of each carriage by a movable foot-board placed over the usual one, which, by the arrangement, is always kept in this position whenever the train is standing at a platform. When the time for departure arrives the signal is given by the guard, and the engine-driver by means of a valve, at one operation, gently closes all the doors left standing open, and locks the whole of the doors from end to end of the train, at the same time the movable foot-board is withdrawn to a position over the existing foot-board, and the train travels to the next station. On arriving at the next platform the engine-driver, by a similar operation of the air-valve, instantly releases all the doors from end to end of the train, and at the same instant the movable foot-boards advance outwards, and completely bridge over the spaces between the platform and the wheels as before; in this position passengers can alight from the train as at present. On leaving the platform again the same operation is gone through, as already described. In closing the carriage doors no serious accident need occur by a passenger being trapped in the act of entering a carriage, as, at the time of closing, a signal-bell would be struck on each carriage, and the doors can be closed as slowly as may be desired; and, in addition, a spring-box is attached to the closing levers, so as to enable a passenger, if so caught, to push the door open and release himself, after which the door will at once spring to and become locked, the same as all the rest of the doors. The whole of the apparatus is made to act automatically, so that in case of collision or break away the whole of the doors from end to end of the train would be liberated automatically, and the passengers could leave the carriages at will. As the operation of opening and closing may be instantaneous, or may be regulated at will, no time need be lost on arriving at a platform in releasing the doors; and again, on leaving the platform, the doors being closed all at one time, may be done so more slowly than at present, and the chance of trapping is prevented; which frequently happens at present, when one porter has to rapidly close the doors of a whole train as it passes on leaving the platform. The author believes that were the above appliances in use, that class of accidents which form such a large percentage of the whole would be greatly reduced, such as falling between carriage wheels and platforms, alighting from and entering trains in motion, closing doors, and falling out of carriages whilst in motion. Should a passenger fall in entering or alighting from a carriage whilst standing at a platform, he cannot get between the wheels and the platform; whilst the possibility of persistent travellers entering or alighting from carriages whilst in motion is prevented, the doors being locked until the moment the train stops. Also the possibility of a carriage door flying open, and passengers falling out is prevented, the doors being locked until the next platform is reached. The foregoing are the advantages to the public to be obtained from the adoption of this system. The railway companies are perhaps as interested in the matter as the public, but from an economic point of view. The amount paid for accidents by the companies of the United Kingdom may safely be said to amount to 200,000*l.* annually.

THE DUBLIN SCIENCE AND ART MUSEUM COMPETITION.

In this competition, advertised in our pages, sketch designs are to be first sent in, from which a committee, including at least one architect, will select five. The authors of these will be invited to enter into a final competition, carrying out strictly their original proposals, and each will receive 150*l.* towards expenses. The competitor ultimately selected is to receive a fixed sum equal to five per cent. on the amount the Treasury may authorise to be expended on the building. The sum stipulated for the entire cost is 100,000*l.*

ARCHÆOLOGICAL NOTES.

Berks Archæological and Architectural Society.—About thirty members of this society, under the guidance of Mr. W. L. Nash, of Reading, the hon. secretary, paid a visit to Basingstoke on the 22nd ult. The party proceeded to inspect the ruins of the Chapel of the Holy Ghost, and also the Parish Church. The Rev. Dr. Millard pointed out the features of interest in both buildings. The party then proceeded to Basing Church, where Dr. Millard, at the request of the Vicar of Basing, again acted as guide. The ruins of Basing House were next inspected, under the guidance of Mr. C. F. Cooksey, the hon. secretary of the North Hants Archæological Society, who read a paper upon the history of the place. On the return of the visitors to Basingstoke, they were entertained by the Rev. Dr. Millard, as president of the local society, at the Old Angel Café.

Discovery of a Roman Monument at Hexham.—The *Newcastle Courant* says that on the 21st ult. a remarkable Roman monument was discovered in the porch of Hexham Abbey Church. Mr. Hodges, an architect, now engaged in bringing out a series of illustrations of the church, and Mr. Robert Robson, the clerk, while excavating in the Slype came upon a large slab a few feet below the surface. On further investigation, a monument, about 7 ft. long and 3 ft. 6 in. wide, in a good state of preservation, was disclosed, the upper portion containing a figure of a mounted warrior, bearing the Roman standard, with his horse in full career, and a conquered foe at his feet. Below this is a tablet with the following inscription:—

DIS MANIBVS ELAVNUS
LQ ALAE PETR SIGNIFER
TVRCANDIDI AN XXV
STIP VII H S

From this inscription it would appear that the hero of this monument was a standard-bearer in the Troop Candidi of the body of cavalry known as the Ala Petriana.

ALL SAINTS', SOUTH LAMBETH.

The Church of All Saints, South Lambeth, built some three or four years since by the firm of Messrs. Lucas Bros. at a cost of 13,500*l.*, exclusive of the site (1,200*l.*), has already been found too small for the crowded congregations assembling there. Mr. Sidney Smith, architect, was instructed to draw plans, &c., for the addition of transepts, and these are being carried out, and just reaching completion, by Mr. Wm. Shepherd, of Bermondsey New-road.

The congregation requested the southern transept to be made as a memorial of their love and esteem for the vicar, and to their credit be it said that though in five years, directly and indirectly, they have raised 14 000*l.* for the building, &c., of the church, yet in six weeks they have again promised a sufficient sum to cover the expense of the new transept.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,911. J. Wetter, New Wandsworth. Reflectors. (Com. by W. Wheeler, Massachusetts, U.S.A.) Sept. 9, 1881.

3,961. R. H. Reeves, Parkhurst. Construction of drainage for the purpose of destroying noxious gases, &c., arising from sewage. Sept. 14, 1881.

3,968. F. T. Bond, Gloucester. Heating water for domestic purposes, including an improved gas-burner. Sept. 14, 1881.

3,972. S. C. Davidson, Belfast. Stoves, &c. Sept. 14, 1881.

3,985. H. H. Lake, Southampton-buildings. Door and other knobs. (Com. by C. C. Harrington, Newton, U.S.A.) (Com. spec.) Sept. 15, 1881.

NOTICES TO PROCEED

have been given by the following applicants on the dates named.

Sept. 13, 1881.

2,000. E. Edwards, Southampton-buildings. Wrought-iron window-frames. (Com. by C. A. Schürz, Stralsund.) May 9, 1881.

2,040. P. Jensen, Chancery-lane. Production of artificial stone or composition, &c. (Com. by E. J. Erichsen, Copenhagen.) May 10, 1881.

3,620. J. Craig, Kilmarnock. Dressing enamelled bricks, tiles, or slabs. Aug. 19, 1881.

3,826. E. L. Dietz and M. A. Dietz, Oakland, U.S.A. Dust-pans. Sept. 2, 1881.

Sept. 16, 1881.

2,059. A. Guattari, Covent-garden. Producing upon marble, &c., designs, in imitation of sculpture. May 11, 1881.

2,087. G. Osborne, Brighton. High-pressure regulating taps or valves. May 13, 1881.

3,081. W. Dawes, W. H. Thompson, and D. Thompson, Leeds. Water-closets and urinals. July 14, 1881.

3,811. H. Hall, St. Pancras. Tiles for facing or lining walls, &c. Sept. 1, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending Sept. 17, 1881.

505. T. Rowan, Ryde. Chimneys or flues.

To provide an effectual up-draught, the flues open into a chamber from which passes a shaft on the top of which is a cowl to produce an induced current. To purify the smoke an additional chamber is fitted above the former chamber, which is supplied with a damp porous material. Feb. 5, 1881. Price 6d.

527. A. Clark, New Cross. Water-closets.

The wood framing is dispensed with, and the casing is constructed of porcelain, &c., in one piece with a sloping partition leading to the trap for receiving the contents of the basin. This basin is of the revolving or lift-up kind, and is provided with a flushing-pipe and scraper. Feb. 7, 1881. Price 6d.

540. E. H. A. Herbert, Erith. Apparatus for creating an upward draught in chimneys, shafts, &c.

The chimney-shaft is capped by an elbow, supported so as to be capable of rotation by the air acting on a blade above its horizontal part. Through the vertical part of the elbow is a smaller pipe, with an enlarged mouth-piece, which is presented to the wind, and thus draws out the contents of the vertical portion. (*Pro. Pro.*) Feb. 8, 1881. Price 2d.

550. S. H. Sharp, Leeds. Manufacture of fire-grate card-board ornaments.

These are made of one piece, and an ornamental design is stamped out of them to allow a free passage of air. (*Pro. Pro.*) Feb. 9, 1881. Price 2d.

557. J. Davidson, Auchmill. Draw-off taps of kitchen boilers.

These are formed so as to serve also as safety-valves. The shell has an enlarged chamber, having a horizontal partition across it, which divides the inlet part of the tap from the outlet part. Through the centre of this partition is formed a hole, fitted with a valve with a stem which passes out through the shell, and is fitted with a weighted lever. The tap is opened to draw water off by raising the lever. Feb. 9, 1881. Price 6d.

561. C. D. Phillips, Newport. Roofing tile.

On each of the four sides of the tile is formed a system of grooves with corresponding tenons, so that each tile shall lock into the four surrounding ones. Feb. 9, 1881. Price 6d.

571. H. Mestern, Berlin. Apparatus for ventilating, cooling, and warming buildings, &c.

Two chambers are used, one inside the other, with a space between them. The inner one is open at each end. At the upper part water under pressure is admitted through a nozzle into the top of the inner chamber, into which air also is free to enter. The water ejected from the nozzle with great force fills the inner chamber with a finely divided spray of water, and draws with it the air from the room. The water escapes from the bottom of the outer chamber by a pipe, and the air being relieved passes up the space between the two chambers, and escapes into the room purified and cooled; or, if hot water issued, heated. Feb. 10, 1881. Price 6d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

581. F. Edwards, jun., Great Marlborough-street. Slow-combustion smoke-consuming grates.

The fire-place is charged with sufficient fuel for the day, and is lighted on the top. A balanced screen is moved down in front of the bars as the fire burns away to expose the fuel to the action of the air. The improvements in this invention are the manner in which this screen is balanced and hung. Casings of metal are attached, one on each side of the front of the grate, and constructed to contain the pulleys and counterweights for the screen. These casings are also flanged or grooved on their inner sides to act as guides for the screen. The grate has a solid bottom. Feb. 10, 1881. Price 6d.

582. J. Sherwood, Birmingham. Galleries of gaseliers.

To one of the arms is pinned a free cranked lever governed by a spring. On the glass being placed in position, the spring presses the lever against the glass. Feb. 10, 1881. Price 4d.

602. L. Appleton, Brecknock-crescent. Appliance for preventing the bursting of water-pipes by frost, &c.

This is a vent-tap or cock, which, in addition to the usual passage, has a lateral aperture communicating directly with the main passage of the plug, and allows air to flow into the pipe when the cock is closed. (*Pro. Pro.*) Feb. 11, 1881. Price 2d.

EDINBURGH.

The Burgh Engineership.—Mr. Fraser, the burgh engineer, has resigned his office on account of ill-health, but he will continue to act as consulting engineer. The sub-committee of the Lord Provost's Committee, appointed to prepare a report on the duties and salaries of the officer to be appointed in the room of Mr. Fraser, as also with reference to the management of the streets and foot pavements, previously to steps being taken for filling up the vacant office, have resolved to recommend that the supervision of pavements should be transferred to the Roads Department, and Mr. Proudfoot's salary continued at 400*l.* a year, the new burgh engineer, in consideration of the advice to be afforded by Mr. Fraser to the gentleman appointed, to receive a salary of 300*l.* An amendment to the effect that an experienced engineer should be appointed at a salary of 500*l.* was negatived.

The Old Infirmary Buildings.—The sub-committee of the Treasurer's Committee of the Edinburgh Town Council, charged with the arrangements for the conversion of the portion of the Old Royal Infirmary buildings, purchased by the Corporation for the purposes of a fever hospital, have (according to the *Scotsman*) instructed Mr. Morham, the City Architect, to proceed with the preparation of the necessary plans; the burgh engineer, to examine and report as to the drainage; and Dr. Littlejohn to report as to the allocation of the wards for different kinds of infectious diseases.

MONUMENTAL.

The Eurydice Memorial.—A monument, the preparation and erection of which has occupied twelve months, has been placed in Haslar Naval Cemetery, to the memory of the officers and men who were lost in the training-brig *Eurydice*, in March, 1878. The base, which is of polished granite, and records the names of 316 officers and men who went down, was prepared by the convicts at Chatham, while the superstructure was prepared by the convicts at Portland, with stone from the neighbouring quarries, and resembles a huge rock, which is surmounted by the real anchor of the *Eurydice*, embedded in the rock. The memorial was designed by Colonel Pasley, R.E., director of works, and it has been erected by the Works Department of the Navy.

The late Dean Stanley.—The daily papers say they have reason to believe that it is the intention of Dean Stanley's successor to take an early opportunity of calling a meeting to consider the best mode of raising within the walls of Westminster Abbey a monument to his lamented predecessor. It is understood that a proposal which has already received influential sanction, as both appropriate in itself and likely to receive wide and general support, is that of an altar-tomb, with recumbent statue, to be placed in the Chapel of Henry VII., in the immediate vicinity of the grave in which the remains of the late Dean were so recently laid by the side of those of Lady Augusta Stanley.

Torquay.—The Local Government Board have sanctioned a loan of 3,000*l.* for the purpose of erecting a Sanatorium at Torquay. Mr. Ernest Turner, of Regent-street, is the architect.

TECHNICAL EDUCATION FOR "THE UPPER TEN."

MURAL DECORATION.

Sir,—Notwithstanding the labours of a most efficient Royal Commission of some forty years past, and all that has been written since on mural decoration, the crass ignorance on the subject appears to remain as unshaken and as immovable as ever. For instance, in your leader of Sept. 17, you have to call attention to the flagrant violation of so elementary a principle of decoration as that against introducing pictorial glass into chambers in which mural painting is destined to play a conspicuous part. The two are incompatible. This was authoritatively laid down in the reports of that Royal Commission; how uselessly, we see, from the fact that the very chambers in which the members of that Commission used to meet and deliberate are being treated in direct contravention of the precepts they had so carefully gathered to guide the decoration of the palace at Westminster. But knowing, as all men who have carefully studied the history of art know, how important the encouragement of mural painting is to national art, no stone must be left unturned in the endeavour to help the *dilettanti* to a better understanding of the subject. I therefore beg leave to subjoin a few concise memoranda upon the noble art of mural painting.

1. In the decoration of a building, pictorial glass and mural pictures are incompatible; for neither oil, fresco, nor encaustic colours can compete with the chromatic brilliancy of glass. Grisaille, with a small plaque of moderated colour, is the utmost that should be permitted when mural painting is to be the leading decoration.

2. By far the larger number of the finest paintings ever executed were painted in fresco: were decorative works.

3. Mosaic is an imperfect method of execution, and can only be appropriately employed in out-of-the-way spaces,—spaces far removed from the eye.

4. The execution of mosaic was thoroughly understood in the time of the great Italian painters; nevertheless, it was only sparsely employed, under the foregoing conditions. Perhaps mural painters only can thoroughly understand the ridicule with which Michelangelo and Raffaelle would have received a suggestion that their grand works in the Sistine Chapel and the Stanze of the Vatican should be executed in mosaic.

5. Mural painting is the most difficult branch of the fine arts, requiring long and special training. A painter who has been successfully educated to paint easel pictures may yet be totally unfit to grapple with the conditions of mural painting.

6. The *technique* of fresco painting is much more difficult than that of oil. The permanence of fresco depends on the permanence of the mortar on which it is painted, and we have specimens of mortar as hard as stone after an exposure of a thousand years to this climate.

7. If you want fresco-painters you must raise them. Continued demand would bring efficiency. A great country must be at the cost of some failures in painting, as it has been in some other more expensive matters.

8. The fine-art manufactures attained their fullest development in those two epochs in which painting and sculpture were immediately associated with architecture.

9. Seeing, then, of what vast importance the training for mural painting is to the manufacturers of a country, any one who stands in the way of its adoption in England cannot have the improvement of our manufactures seriously at heart.

10. Mosaic is quite out of court as a method of decoration save and except under those certain conditions we have referred to. But whether in fresco, spirit fresco, tempera, encaustic, water-glass, or even oil, let us have, for the sake of the arts and manufactures of the country, a school of mural painting.

11. It is a common mistake of hon. members to call any painting upon a wall a fresco, whereas they ought to know the term "fresco" is only properly applicable to that kind of painting which is executed in colour and water on fresh mortar; the mortar when dry holding the pigments in its film of carbonate of lime. The vehicle of spirit fresco is wax, oil, &c. Spirit fresco is a new process whose durability is not yet proven. Tempera is colour mixed with size. Encaustic is the use of liquefied wax; the term *encaustic*, however, is ; properly applied to painting with wax when heat is used in the process. Water-glass painting is the use of a solution of silicate of potash over the painting in colour and water on th dry mortar; these colours it incloses in a glaze of silicate.

W. Cave Thomas.

THE CHURCHES AND TOWNS OF BUCKINGHAMSHIRE.

Sir,—Is your correspondent, Mr. Joseph Simpson, really under the impression that there are no larger or more beautiful churches in England than that of Newport Pagnell? It would seem so, from the following extract which I have copied from his letter:—

"Does he know Newport Pagnell? Here is a town, although with a population of some hundreds less than 4,000, yet with a church which for size, beauty (both of external situation and internal arrangements), and attendance is not to be surpassed in this or any other county."

Now if the words "size" and "beauty" refer to the church in question, I can only suppose that Mr. Joseph Simpson has never been out of Buckinghamshire, because, leaving cathedrals and monastic churches out of the question, it is simply ridiculous to compare Newport Pagnell Church with any one of the famous Lincolnshire churches,—Louth, Newark, Grantham, Raunds, Higham Ferrars, &c.,—or with the Suffolk churches, such as St. Mary's Bury, Lavenham, Long Melford, Southwold, &c.; or those of Norfolk,—Walpole St. Peter's, Tarrington St. Clement's, Salle, East Dereham, Cawston, Cley-by-the-sea, Worstead, St. Peter's and St. Stephen's Norwich, St. Margaret's and St. Nicholas Lynn; or with the great Yorkshire parish churches, Rotherham, Patrington, &c. But to come nearer home,—to the counties adjoining Buckinghamshire,—does Mr. Joseph Simpson for a moment mean to compare Newport Pagnell Church with that of Leighton-Buzzard, or even with Luton, or with Ewelme, in Oxfordshire? I have not mentioned monastic churches; that would really be too ridiculous.

If the words "size" and "beauty" refer to the "exterior situation" the first of the words is unintelligible, and equally so if they are intended to refer to the "internal arrangements." If Mr. Joseph Simpson means them to refer to the "attendance," I will not argue the point for a moment; I dare say the congregation is large and *beautiful*.

Although Mr. Simpson has kindly attempted to set me right with regard to Buckinghamshire, I fear I must remain in obstinate darkness, if enlightenment means the acknowledgment that Buckinghamshire is a good field for ecclesiology, or that its towns are cheerful and rich in old churches. Look, for instance, at Buckingham, Stony Stratford, Fenny Stratford, Slough, Great Marlow, Wolverton, or even Aylesbury: can they be called lively places, or can their churches be regarded as fine examples of ancient architecture?

Buckinghamshire is one of the very few counties in England which contains no great representative church, and not one monastic church;* nor does it contain any very important parochial churches. The village churches are small and far apart; several of them, I confess, are of considerable archæological interest; such, for instance, as Stewkley, Wycombe, Caversfield, Upton, Wing, Stantonbury, Chesham Bois, Langley, Burnham, Mentmore, &c. These, together with the churches mentioned in the article upon Maids Morton Church, form the chief attractions for the ecclesiologist in Buckinghamshire, and I think I am quite justified in saying that it is by no means a rich county for the ecclesiologist. To compare it with Lincolnshire, Norfolk, Suffolk, Northamptonshire, Somersetshire, and Wiltshire would be absurd, nor can it even hold a place in comparison with the adjoining counties of Oxfordshire, Berkshire, Bedfordshire, Middlesex, or Herts. I may mention the facts that I have visited Buckinghamshire every year for the last

* At Chetwode is a portion of an old monastic church, of very beautiful Early English work, but it can never have been a very important building as to size. The county is remarkably poor in monastic remains; a few fragments alone exist of the Abbeys of Burnham and Nutley. I am told that a part of the cloister still exists at Ashbridge, but I have not seen it. It is strange that although the county once possessed several important castles, not one single stone of any such edifice is to be found at present *in situ!* Buckinghamshire is probably the only county in England of which this can be said.

thirty, and that I have walked over a great portion of the county, and the impressions left upon my mind are, that, with the exceptions of Olney, Hillesdon, and Chetwode, the larger churches are rather poor examples of Mediæval architecture; that the village churches, with few exceptions, are less interesting than those of other counties; and that the towns are singularly dull and ugly, and, as a rule, devoid of objects of antiquarian interest.

THE WRITER OF THE ARTICLE UPON MAIDS MORTON CHURCH.

THE WORD "NATURE" IN REFERENCE TO ART.

SIR,—I have no doubt but that you are right in taking exception to the way in which I expressed myself in my last letter, but at the same time I do not see how this affects the original question,—whether I am wrong in saying "that all ornament should be founded on a geometrical basis." Although this is laid down as one of the "principles" in "Suggestions in Design," it is not intended that it should ignore the fact that there is much ornament which is non-geometrical. I have purposely stated that the principles given are founded upon the practice of art in the *best* ages. If you ask me what I mean by the best ages, I would say, roughly speaking, the Greek and the Early Gothic.

There is, more or less, a geometrical or regular foundation underlying everything in nature, whether it be organic or inorganic, although in its development it is apparently so extremely irregular. When I refer to "nature," I do not confine the expression to one view of nature only, but to nature in its widest and most extended sense,—to the principles or laws, wherever they can be discovered, which can in any way be made applicable to the purposes of ornamental art. I cannot, therefore, consent to be restricted to look at nature in three different ways, or to state "whether I mean according to *metaphysical laws* or *physical laws*." It is true that I may not be able to see far into the hidden laws or concealed principles in nature, and that I may yet be like a child picking up mere grains of sand on the sea-shore; but that such principles are to be discovered, I am convinced, and they may be made available as the groundwork for all art-workmanship.

It may be that I have not stated my position as logically as could be desired, being, as you say, more at home with the pencil than the pen; but all my life I have endeavoured to study nature in this way, searching for principles of growth or formation, which should guide me in the composition of ornament, and not merely for the purpose of copying the physical form. If I take a leaf or a flower as a *motif*, I strive to understand its principle of formation, and work upon that, rather than to imitate the form I see before me, so that my leaf or flower may, apparently, be very unlike that from which it is taken. I may be singular in my notions, but this I believe to be the only true way of applying nature to art, and that all art, in its broadest sense, should be founded upon nature. I cannot, therefore, see that it is necessary or advisable that I should define exactly what I mean by "nature," or whether I look upon it in a *physical* or a *metaphysical* sense. What I advocate is, to take advantage of natural laws wherever they can be perceived, to adopt the external form when suited to the purpose in view, but above all, not to compose anything which is *un*-natural.

JAMES K. COLLING.

CONVEYANCE OF MATERIALS.

SIR,—Some time ago I observed in use at the constructing of the fortifications at Strasburg a method of conveying building materials from one place to another, and have since seen the same in use in America, for conveying goods from the manufactory to the warehouse. I understand it to be an endless wire rope that is kept moving (by machinery) between the factory and the warehouse, and the goods are attached to the rope when passing. Will any of your readers kindly furnish me with the address of parties who fit up such appliances, if there are such in this country? J. A. G.

The Interior of Holy Trinity Church, Leamington, has just been improved by the addition of a carved Caen stone pulpit, with marble shafts, and oak choir-stalls. Brass gas-standards and lectern have also been added. The work has been executed by Messrs. Jones & Willis.

"THE TREATMENT OF CANDIDATES."

SIR,—Your heading and report upon this subject in relation to the recent appointment of Waterworks manager at Middlesbrough calls loudly for some comment upon the manner in which candidates for public offices are frequently treated. We have recently witnessed the creation of several municipal bodies and the farcical proceedings they inevitably inaugurate, of advertising for a staff of officials, when at the same time they have no intention, or the very remotest one, of changing those who have already held office under their tutelary powers as local boards, &c. This, I contend, is altogether misleading and insulting to the intelligence of the men for whom they advertise. Indeed, our Nestors of municipal power seem to be frequently at sea as to what is their plain duty, and the *modus operandi* they ought to and should pursue in the selection of candidates.

I leave you, sir, to imagine the feelings of disgust with which candidates look upon such proceedings, and the contempt which they naturally feel for these "most potent, grave, and reverend signors," and the curses, not loud but deep, for the trouble and expense to which their folly frequently puts many a poor candidate. CONSTANT READER.

LONDON FRONT GARDENS.

SIR,—There can be no question that a small open space in front of a London house, where a tree or shrubs can be planted, does add much, as Messrs. H. & R. Powell point out, to the agreeable character of a street. I am inclined, however, to think that it is most satisfactory if a single tree is planted near the outside edge so as to shade the pavement, or a line of shrubs is placed on this outside edge as a screen, and the interior part covered with plain tiles, on which shrubs or flowers in boxes can be placed. This prevents the untidy and dismal appearance seen in too many front gardens, even on Campden-hill, as the space, if left unadorned florally, is at any rate neat. Nor is a little strip of so-called garden at all times an unmitigated blessing, for in Stafford-terrace, Campden-hill, one of the streets mentioned by your correspondent, the stupid builder has placed the larder beneath the garden, so that it is damp instead of dry. Passing, like your correspondent, the other day along this street, I observed the earth being carried away, and the garden space about to be filled with cement and tiles by some occupier, who, as several other tenants have already done, was remedying the mistakes of the builder.

AN OBSERVER.

MANAGEMENT IN THE WORKSHOP.

SIR,—I am glad to see that you have opened your columns to a communication on the subject of "management in the workshop," and have read with satisfaction the letter of "Observer," in which he mentions some of the evils of the present system. There are, however, several he has omitted, and others which I think should be brought into greater prominence. With your permission, I should like briefly to refer to two or three of these, and in doing so shall speak from my own personal experience and observation. I have known several instances in which young men have come up from the country with slight practical knowledge, but with a friendly introduction to the head foreman. The latter, in consideration of a premium or a weekly present, soon places them in positions for which they are utterly unqualified. Do not suppose this was merely a Christian act. In some cases I know the premium has been 20*l.*, whilst, in others, the man pays his foreman so much "blackmail" every week. The "greenhorn," as I may call him, is generally placed by the foreman with a competent man, who, being thus handicapped with an inferior hand, is unable to get out the work as expeditiously as he would were his companion competent. The consequence is complaints come from the office that a certain job has cost too much, and the next thing is the discharge, not of the friend of the foreman, but of the competent hand, who is sacrificed for no fault of his, whilst his useless mate is kept at the bench to the advantage of the foreman, though to the disadvantage of the employer. If managers or masters would inquire of the men how these unaccountable things occur, instead of leaving everything in the hands of subordinates, they would find it more profitable than the present system. I have known many cases in which quantities of material were spoiled by the incompetence of the setter-out,—invariably a relative or friend of the foreman. Wood sent up to the shop I have known rendered useless for the job for which it was intended, owing to the lengths being wrongly taken off the rods, whilst in other cases, when (it seemed as if by accident) the sizes were right, there was nearly double the quantity required. This, it is needless to say, showed either gross ignorance or great stupidity, but whichever it was the master suffers.

I can fully confirm "Observer's" remarks respecting "Cousin Jackey," who appears to be of a more prolific family in London than we often meet with in provincial towns.

ONE WHO KNOWS.

*** Other correspondents make similar statements. We have also received a letter signed "One of Them," denying the correctness of "Observer's" comments, but this can only represent the writer's own experience and practice, and does not affect the charges made. There are, of course, large numbers of foremen acting in the best and most honourable manner. The only question is whether the practices described are carried on to any extent by others, and the letters which have reached us seem to show that they are. Employers should themselves look into the matter.

UNSANITARY BUILDING.

SIR,—At no time does the profession of an architect appear more valuable to the general public, and his services more necessary, than when diseases of a loathsome and dangerous character become rampant. This year small-pox, scarlet fever, typhoid fever, and measles have extensively prevailed, and I cannot help thinking that if the dwellings of the humbler classes and many of the middle classes, were properly constructed, kept in a good and proper state of repair, and clean, according to the best known methods of executing the various branches of work connected with the building trade, there would be very much less disease. But, unfortunately, too much of the work in the building trade is executed without any regard to efficiency or the laws of health, and in the course of time neighbourhoods which have once been known as healthy have become notorious for disease, and many persons have been brought to ruin by the depreciation of the value of their property, and the poorer classes have become pauperised from the want of a better class of inhabitants in the locality to find them the employment necessary for their subsistence. WILLIAM HEY.

THE SMOKE NUISANCE.

SIR,—A prize is offered to free London from smoke; why falter, ye clever ones? This is no joke. Fair play this time, "be on the job"; no filching, no snubbing from official snob. The project is grand; give breath of life; end this unhealthy wasteful strife. The money is little, for small mercies give thanks; compete, men,—the remedy must come from the ranks. This work is ours, right straight in our line; high-salaried incompetents not in it this time.

R. T.

CONDITION OF FAREHAM.

SIR,—I will only ask you to make a short remark. The Fareham Local Board have made no further protest against the statements contained in my second communication which appeared in your issue of the 3rd ult., neither have they replied to the editorial remarks which appeared in the *Hampshire Telegraph*.

I hear on good authority that the Local Government Board have warned the Fareham Local Board that no further loan can be raised by the latter until the closet system is altered. Perhaps the Fareham Local Board are not aware that it has been declared by high legal authority that in such cases of wilfully permitting a public danger to exist they may severally be indicted for manslaughter should fatal results ensue. QUESTOR.

ROMAN VILLA, BRADING.

SIR,—Will you allow me to warn intending visitors to the Roman villa, Brading, that they had better, when paying their money at the turnstile, have an understanding what they may and what they may not see, as they may find themselves curtly shut out of the larger part, while others are admitted, indeed, pressed to go in, under their nose, as happened to me on Thursday last.

I would suggest to the gentlemen who have the matter in hand that if they cannot afford to keep a proper person there, it would be better to leave the whole in the charge of the old man who looks after the older or earlier-discovered portion. A. A. C.

CASE UNDER THE EMPLOYERS' LIABILITY ACT.

FARMAN *v.* JAVENS.

The plaintiff in this case (which was tried before Mr. Besley, Q.C., in the City of London Court last week, and reported in the *City Press*) was W. Farman, a joiner, residing in Fordham-street, Whitechapel, and the defendant was Mr. J. M. Javens, grocers' fittings manufacturer, Halfmoon-street, Bishopsgate.

Mr. Grain (for the plaintiff) said that on June 20th defendant had completed a sugar shelf, 22 ft. long, 20 in. wide, and 4 in. thick, which was to be lowered from a second story. The ropes were fastened in the usual way, but in letting down the shelf, which was of unusual weight and size, it got caught in a projection from the first floor. His client was ordered by the foreman (named Davey) to go to the floor below and ease the shelf off. He was doing this when the rope was let go by a man named Parrett, who had charge of it, and the shelf swung back, jamming the plaintiff's hand against the rail, which resulted in a serious wound. He went to the hospital and had the wound dressed, but had been incapacitated for work ever since. He claimed 50*l.* damages.

Mr. Fulton (for the defendant) contended that his client had often had similar planks lowered, and there was nothing at all defective in the tackle. He should prove that the blame rested entirely with the plaintiff, who pushed out the plank before another man named Dollard could reach the basement, and Parrett was compelled to let go, which resulted in the accident.

Albert Davey, the foreman, stated that he instructed the plaintiff and Dollard to go below to ease the plank. He did not touch the rope.

John Parrett said he was holding the rope when the plank struck. At first he had the rope fastened, but he had to untie it, as it was too short for him to hold, and when the plank was swung out by plaintiff he was forced to let go.

The judge, in summing up the case, said it was important to give the utmost consideration to claims made by journeymen, as jurymen were supposed to sympathise with the masters rather than with the men—a theory he did not believe. If the jury were of opinion that plaintiff met with the accident while carrying out the instructions of the foreman, and it was owing to the rope held by Parrett being too short for the purpose, they would find a verdict for the plaintiff, but he would not advise them to award the extravagant sum of 50*l.*

The jury gave a verdict for the plaintiff,—damages, 10*l.*

FIRE IN THE MINE.

Sir,—Another mine on fire: the gas, exuding from millions of holes, cracks, and crevices, slowly fills the mine.

How easily and cheaply a remedy could be applied. A small fire-engine to squirt liquefied cement on the roofs and sides liberally; what falls on the ground would bind down the dangerous drifting coal-dust. This coating would prevent falls from the roof and sides by securing them, and every pore would be sealed for ages. R. T.

ASKING FOR WORK.

Sir,—In the *Surrey Advertiser* of September 24th, it is reported that the Clerk of the Guildford Local Board read a letter from Messrs. Gotto & Beesley volunteering their services as consulting engineers at a fee of thirty guineas, and inclosing testimonials. Considering they were not asked, is this quite the right sort of thing? C. E.

CHURCH-BUILDING NEWS.

Llantrissent.—Llantrissent Church, near Usk, has been re-opened, after restoration. The condition of the edifice previously to the recent works was very bad. The nave more particularly bore evidence of damp and dilapidation, and was full of square box pews, old and shabby, and in an exceedingly rotten and worn-out condition. The floors, being uneven and reeking with damp, have been taken up and relaid on solid beds of concrete, after many old vaults were properly repaired and made safe. The whole of the nave roof has had the barrel-plastered ceiling scraped down, and a fine sawn fourteenth-century oak roof exposed to view, the roof being composed of rafters, 6 in. by 6 in. and 18 in. apart from centre to centre, curved and braced. Upon breaking down the plaster barrel ceiling in the chancel, the old axed rafters were found to be so decayed that it was quite dangerous taking them off, and they could not have remained in their position many months longer. These have now been replaced by an open red-pine roof, with principal timbers showing, and the sides framed into panels, with V-jointed boarding, the whole stained and varnished. The square stone tower before the restoration was in a tolerably good state of repair, and, with the exception of pointing and re-setting the battlements on the top, and repairs to bell carriages, this has been untouched. Upon removing old pewing and plaster from the walls of the nave and chancel, an interesting piscina and mural stairs were found. The former has been carefully cleaned and exposed to view, but the latter, owing to some tablets which were not allowed to be removed being fixed in both arches to the same, has again been covered up. All the old stonework to the windows and arches has had the yellowish wash most carefully cleaned off, and the decayed portions made good with new stones, but in no case has any original moulding or splay been altered. The sun-dial was found in the tower, and this has been refixed in its former position over the south porch. The roofs throughout have been covered with Whitland Abbey slates. A new pulpit has been placed on the north side near the chancel arch. The nave has been filled with red pine open seats, with sloping backs, 3 ft. wide, book-boards, &c., these seats being upon a raised floor, with ventilation under the same, all the new woodwork being stained and varnished. The windows have been filled in with coloured cathedral glass, in quarry lights, with marginal borders. The whole of the alterations have been carried out for about 600*l.*, the contract being let to Mr. William Blackburne, builder, of Newport, who has carried out the work from plans prepared by Mr. Lansdowne, architect, of the same town.

High Tointon.—High Tointon Parish Church has been re-opened, after alterations and additions. The interior of the roof, which had been plastered, has been boarded, stained, and varnished. A reredos has also been erected by the vicar's wife in memory of her brother, who died last year at Milan whilst on a tour. It is executed in Ancaster stone, as regards that portion above the level of the Holy table. The lower portion is of red Mansfield stone. The emblems are in mottled Derbyshire alabaster, except the central one, the Agnus Dei, which is of pure white alabaster. In design, the reredos consists (1) of the central feature over the Holy table, which, in order to give it more emphasis, slightly projects beyond the wings, and is of richer character than the latter, and has an ornamental cresting over the cornice. In the centre is a circular panel, its mouldings enriched by pearls carved in the stone, and enclosing a sex-foiled cusped panel with *fleur-de-lis* points, in which stands the Agnus Dei. This panel is flanked by eight circular quatrefoil panels on either side, containing the following sacred emblems:—The Lily, Rose of Sharon, Dove holding Olive-branch, Star of Bethlehem, Passion Flower, Celestial Crown, Wheat, and the Grapes. (2) The wings of the reredos are each divided into three panels, which have square trefoil heads, instead of arched tops, in order to give as much space as possible for the Lord's Prayer, Creed, and Commandments, which are inscribed in legible Gothicised letters on yellow Mansfield stone panels, the lettering being tinted a deep chocolate. Between each panel in the upper part of the reredos is a carved boss in a circular panel. The lower portion of the reredos has been kept plain in design, with lozenge-shaped panels, somewhat having the effect of trellis-work, but to a larger scale. The reredos has been carried out and fixed by Messrs. White & Sons, of Vauxhall Bridge-road, London, from the designs of Mr. B. Edmund Ferrey, architect, London.

Delabole (Cornwall).—A new church, from the designs of Messrs. Hine & Odgers, architects, Plymouth, has recently been consecrated here by the Bishop of Truro. Of Early Geometrical design, it consists of nave, chancel, and south aisle, and seats 300 persons. Situated near to the celebrated slate quarries of Delabole, the walls are of that material, relieved by dressings of granite and Box-ground. The roofs are of steep pitch, and covered with local slate. They are open-timbered, of substantial construction. The chancel roof is enriched by carved angels. The various avenues are of slate, but the chancel floor is of encaustic tiling. The stalls, the lectern, and the chancel fittings are of oak. The font is of Beer stone. It was made by Mr. Harry Hems, of Exeter, who also made the lectern and did the general carving. The windows are glazed with cathedral glass. The contract has been carried out by Messrs. Westlake & Cann, of Camelford.

Plymouth.—Emmanuel Church, at Mannamead, a suburb of Plymouth, has just had a chancel and transepts added to its nave and aisles, which were erected eleven years ago. Messrs. Hine & Odgers, of Plymouth, have carried out the present works. The church is Late Decorated in style, and is well situated upon high ground. Its proportions are lofty. The walling is limestone, the dressings being of Portland and Box-ground. The windows are large, and well filled with tracery. They are glazed with cathedral glass. Mr. W. Morris, of London, is preparing a painted window for the east end, which is a five-light one. The roofs are of steep pitch, covered by slates, and surmounted by high wrought-iron crestings. The roof timbers are of pitch-pine. The chancel roof rests upon sculptured figures of angels in stone. The window labels are stopped by carved heads, and the rough blocks left in the first section have been carved during the present works. Mr. Harry Hems has executed this carving from the architects' designs. The chancel rises three steps from the nave floor. It is laid with Maw's encaustic tiles. The brass gasfittings are by Messrs. Hart, Son, & Peard, of London. The seating generally is of pitch-pine. The chancel stalls are of carved oak and pitch-pine. The pulpit is of oak, and the lectern is of brass. The church is heated by hot air. The builder was Mr. Blowey, of Buckland. The Bishop of Exeter consecrated the church. It is hoped at an early date to erect a south-west spire, 150 ft. high, at a further cost of 1,700*l.*

Birmingham.—The Church of St. Nicolas, Lower Tower-street, Summer-lane, which has been repaired and redecorated, has been re-opened. The church has undergone considerable alteration. New seats of English oak have been placed in the chancel, and the chancel itself has been extended farther into the nave, and enclosed with a low freestone all inlaid with marble panels. A screen, which is of a Gothic design, rests upon this, extend the whole width of the chancel, and rises to a height of about 20 ft. The western screen has been continued across the south aisle. The church has been re-decorated by Messrs. J. R. Lee & Co., of Ann-street. The decorations consist chiefly of bands and pattern-work, stencilled on a greenish-grey ground. The plastering between the rafters of the nave has been finished in a salmon colour, and that between the aisles and chancel-rafters has been coloured a bluish-grey. Texts have been written upon the walls, and the spandrels of the nave arcade and of the windows have been filled in with stencilled pattern work in Indian and Venetian red and black. A painted head of St. Nicolas has been introduced in a circular panel over a recess in the chancel, and the east window has been partly filled in with stained glass, by Messrs. Camm Brothers, the design representing the Crucifixion. The structural alterations have been executed by Messrs. C. Jones & Son, of Belmont-row; and the whole of the work has been carried out from the designs of Mr. John Cotton, architect, of Temple-row.

Knutsford.—The new Church of St. Cross, Knutsford, was consecrated on the 14th ult. It replaces the church built on the same site at the sole expense of the late Mr. Peter Leigh, of Norbury Booths Hall, Knutsford. Though consecrated as lately as February, 1858, it was (according to the *Warrington Guardian*) found necessary in the spring of 1879 to transfer the services to the village school, as the then existing church was pronounced by several firms of architects to be in a most dangerous condition, owing to the breaking of the roof, and the consequent outward thrust of both side walls. The designs of the edifice just erected were prepared by Messrs. Paley & Austin, architects, Lancaster, and the contractor was Mr. Hamilton, of Altrincham. The cost has been 4,000*l.* The building, which is composed of brick and terra cotta, supplied by the Knutsford Brick and Tile Company, consists of nave, transepts, chancel, tower, vestries, and porch. Its total length is 120 ft., being 18 ft. longer than its predecessor. The width of the nave is 23 ft.; of the transept across the nave, 52 ft.; and of the chancel between the side chapel and the organ, 24 ft. The pitch of the roof of the nave is 36 ft. from the floor line; and the tower, 81 ft. in height, is fitted to carry a full peal of bells, with ringers' room, &c. The chancel is separated from the nave by a metal screen, with gates. It contains fifty-five seats for the exclusive use of the choir, with two prayer-desks. The organ-chamber is on the south side of the chancel, and on the north side of the small chapel, which, along with the north transept already mentioned, is used by the children of the school at the morning services. Eastward of the chancel is the sacrarium, with sedilia, credence-table, and the altar, standing under a five-light tracery window, filled in with stained glass. The pews are of pine. The floor of the chancel is laid with ornamental encaustic tiles. Several special gifts have been made to the church. The five-light east window has been filled in with stained glass illustrative of various incidents in the life of Christ, at the sole expense of Major Hill, one of the churchwardens, in remembrance of his parents and sister. The window was furnished

by Mr. Forrest, of Liverpool. An alabaster font, made by Mr. Roddis, of Birmingham, was the gift of Mr. and Mrs. M. M. Speakman, of Knutsford. Mr. W. Jones, J.P., of the Grange, Knutsford, contributed a carved oak pulpit, which rests on a white stone pedestal. The reredos has its central part composed chiefly of wood, carved by Mr. F. Armitage, of Bowden, and given by Mr. B. Gibbons, of Knutsford.

Stourport.—The erection of a new church, from designs prepared by the late Sir Gilbert Scott, at a cost exceeding 30,000*l.*, has been commenced at Stourport. The cost will be principally defrayed through the munificence of the vicar.

Sunderland.—St. Bede's Mission Church has been re-opened, after alterations. The platform which did duty as a pulpit has been removed, and the recess forms a chancel, the window having been filled with painted glass, by Barnett, of Newcastle, the subject being the Good Shepherd. A new pulpit, prayer-desk, and lectern, and an American organ, have been supplied. The exterior has also undergone a change, a belfry having been erected, surmounted with a stone cross. The alterations have been executed under the direction of Mr. M. Greener, architect, Sunderland.

STAINED GLASS.

Halifax.—A two-light stained-glass window has been erected in the north aisle of the old parish church of Halifax by the officers of the 33rd (Duke of Wellington's) Regiment, as a memorial to four of its late officers deceased during service, viz.,—Major A. J. Weeding, Captain E. S. Wason, Lieut. R. S. P. Robinson, and 2nd Lieut. J. B. H. Carmichael, the two last killed by the landslip at Naini Tal, India, September 18th, 1880. The subjects (from Acts x.) are:—(1.) The angel appearing to Cornelius; (2) Peter visiting and raising the kneeling Cornelius. Each subject group is surmounted by a canopy. The window and tracery are of severe fifteenth-century style. In the bases of the lights are respectively the crests of the Duke of Wellington and of the regiment. A surrounding riband bears the names of the battles inscribed on the regimental flag. The window, by Messrs. Powell Bros., Leeds and London, was erected under the superintendence of Mr. Jackson, architect, Halifax.——In St. John's Wesleyan Chapel, a two-light window, which is dedicated to the memory of Annie, wife of Mr. Henry Edmunds, junior, has just been completed. This window has also issued from the studio of Messrs. Powell Bros. An allegorical figure of "Faith" occupies one light, and another of "Hope" the respondent light. The former is partly supported by a staff, cross crowned (emb'ematic of the Gospel Word); the latter rests her right hand on the emblem anchor that entereth within the veil. Each stands in front of a shoulder-high white and gold diapered screen, beneath a richly-carved canopy. The ornamented tracery, canopies, and bordures are in fifteenth-century style. The erection of the window was under the superintendence of the architect, Mr. W. Swinden Barber, of Halifax.

Westerdale (Yorkshire).—A two-light window, dedicated to the memory of the late Col. the Hon. Octavius Duncombe, lord of the manor of Westerdale, and for twenty-five years M.P. for the North Riding of the county of York, has been unveiled. The window is in the nave. Each light is divided into two compartments by decorated bordures, allowing of the introduction of four groups, illustrating respectively the Nativity of Christ, his Baptism in Jordan, Crucifixion, and Ascension. The window is from the studio of Messrs. Powell Bros., Leeds, Mr. H. Perkin, of Leeds, being the superintending architect. ——At the same time was unveiled another and smaller painted window, over an entrance-porch, of which the subject is "Christ blessing little Children," dedicated to the memory of two infant children of the Rev. John Rathbone Ellis (the rector), interred at St. Asaph. This window is also by Messrs. Powell Bros.

Edinburgh.—The large central window situated in the south wall of the Preston aisle of St. Giles's Cathedral has been filled with stained glass, the design being illustrative of the life of St. Paul. The window is of large proportions, measuring fully 25 ft. in height by 12 ft. in width, and consists of ten compartments, in addition to the flowing tracery above. The two conspicuous events in the life of St. Paul are depicted,—his Conversion on the way to Damascus, and his Preaching at Athens. The upper panels are devoted to the former, and the lower panels to the latter. The whole work has been designed and executed by Messrs. Ballantine, under the honorary superintendence of Mr. Robert Herdman, R.S.A., and the St. Giles's Restoration Committee. The window is the eleventh of the series of completed windows. The memorial is inscribed, "In memory of Duncan Monteith, merchant, Calcutta, born at Thornhill, 1812; died at Edinburgh, 1879; erected by his daughters, Margaret, Agnes, and Sibla, 1881."

London.—A window of painted glass has just been erected from the design of Mr. Burne Jones in St. Peter's Church, Vere-street, Oxford-street. It occupies the whole east end of the chancel. The central group represents our Saviour conversing with the woman of Samaria.

Newbury.—The new window which has been provided from the funds of the St. Nicholas Stained-glass Window Society, and which is one of a series it is proposed to insert, has been filled in in the south aisle of the parish church, by Messrs. Hardman & Co., of Birmingham. It consists of four lights and tracery. The subjects chosen for illustration are taken from the parables of our Lord. In the first or dexter light is depicted the parable of the Pharisee and the Publican; in the two middle lights that of the Wise and Foolish Virgins; and in the fourth or sinister light the Return of the Prodigal Son.

Kidderminster.—A stained-glass window has been placed in the north transept of St. John's Church, Kidderminster, by Mr. W. J. Wyley, in memory of the late Mr. Joseph Kitley. It is a three-light window, and represents scenes in the life of Daniel, the prophet. In the first light Daniel is represented as interpreting the King's dream; in the second he is occupying the position of the president of the council; and in the third he is on his knees, praying. The window has been supplied by Mr. John Davies, Wyle Cop, Shrewsbury.

Miscellanea.

Proceedings at the Clerkenwell Vestry.—At the last meeting of the Clerkenwell Vestry, held on the 23rd ult., two hours were spent in a somewhat acrimonious discussion arising out of a motion for the acceptance of a tender, amounting to 48*l.*, for some carpenters' work. The motion was to the effect that the tender should be accepted "on condition that no commission be paid to Mr. ——"(one of the Vestrymen being named). The member referred to made an explanation denying that he had ever received commission from contractors on work done for the Vestry, and ultimately the subject was referred to a committee of the whole Board. The next business was the appointment of an assistant in the Surveyor's office. Six candidates had been chosen by a committee deputed to examine their drawings, testimonials, &c., and these candidates duly appeared at the vestry meeting, expecting that one of them would be elected to fill the vacancy. But, we are informed, nothing of the sort took place. The assembled vestrymen voted for a candidate not included among the six recommended by the committee. As soon as the voting was over, a member asked whether it was true that the chosen candidate had been introduced to many vestrymen by the Surveyor during the week? This query was met by cries of "Too late!" Nevertheless, some explanation appears to be needed.

An Abstracted Picture.—A mysterious affair, recalling the strange disappearance of the Gainsborough picture some years ago, is now being investigated by the Scotland-yard authorities. The picture known as the "Monarch of the Meadows," painted by Mr. T. Sydney Cooper, R.A., and the property of Mr. Allcroft, M.P., of Lancaster-gate, Hyde Park, has been destroyed or stolen. On the morning of the 13th inst. a room in Mr. Allcroft's house, in which the picture was standing during the general repair of the building, was discovered to be in flames. The Fire Brigade were at once summoned, and the fire was rapidly got under. On examination it was found that the picture had been cut out of the frame either before or after the fire had commenced. The police were at once communicated with, and the most searching investigation is being made into the matter. The surprising part of the affair is the fact that no traces are to be found of an entrance to the house having been obtained. The painting was valued at 5,000*l.*

Hull and Barnsley Railway.—The work of the dock in course of construction in connexion with this line have made great progress during the last few weeks. The river embankment is being rapidly raised, and in some parts is only 5 ft. below high-water mark. As many as fifty cargoes of chalk are discharged every week. A great part of this material is brought from the quarry of Messrs. Lucas & Aird, at Barton; but the progress made is so rapid that at present they find their own quarry will not supply all the chalk required, and much is also obtained from other sources. A large cofferdam which will contain about 1,500 piles, and which is being constructed in front of the entrance, is being pushed with all vigour. Preparations are being made for continuous work, night and day, and in a few days there will be two powerful electric lights in use, and these will enable the work to proceed continuously. A powerful double dredger is at work removing the Hebbles Shoal from the entrance, and the material dredged is carried in iron hopper barges behind the chalk embankment, and assists in filling up the quays. The concrete foundations of the north wall of the dock are being laid, and upwards of 150,000 cubic feet of stone have been deposited on the work, so that, when once commenced, the masonry of the dock-walls will progress without any delay whatever. It is expected that the foundations will be ready, and the first stone laid, in a few weeks. The stone is all brought from the fine quarries near Leeds and Harrogate, and is of the hardest description. All the bridges are now built between Spring-bank and the Beverley-road, so there will be nothing to delay the progress of the embankment. The bridge over the Beverley-road will be commenced almost immediately on the east side of the river Hull. A start has been made on the bridge and viaduct over the Sutton Drain.—*Engineer.*

The Retabulum in Westminster Abbey.—"H. P." writes to *Notes and Queries*:—"Who was the first discoverer of the retabulum which is now exhibited at the back of the sedilia in Westminster Abbey? I forestall this query, to which, otherwise, your valuable columns would at some future day be subject. I also forestall the reply, because I think I have the true one, and because I think it ought not to be delayed." He goes on to show that the credit has been given to the late Mr. Blore, on the strength of a printed paper left by Mr. Willement, and then continues,—"I have lately come across another paper on the same subject, dated thirty-four years before that of Mr. Willement. This paper is dated July 19, 1817; it is by Mr. John Carter, F.S.A., draughtsman and architect, a frequent contributor to the *Gentleman's Magazine*. This paper was the last but one that he wrote, for he died, aged sixty-nine, on the 8th of the following September. After commending the waxen portrait and dress of King Charles II.'s effigy, he says:—

"In a box inclosing other Royal wax figures in Islip's chantry, has been substituted, by way of covering, some compartmented work of small mosaic ornamental carvings and paintings of figures, of a design so delicate, an execution so exquisite, that an absolute view alone of the same, and that with the utmost attention, can give the least idea thereof. No hesitation need be made, when it is affirmed, that it must have been a small portion of the highly estimated shrines that once rendered the scenic display of the interior of the pile so shining and glorious!"

Messrs. Thomas & Sons' Lifts.—Sir E. J. Reed, M.P., has been visiting Cardiff to inspect the Exhibition there. After leaving the Drill-hall, the member for the united boroughs proceeded to the Acme Hoist Works, Penarth-road, recently erected by Messrs. Thomas & Sons. He made a survey of the works, but was more especially interested in the specialities which were shown to him in self-sustaining hoisting machinery. Of these he spoke in terms of approval, foretelling to Messrs. Thomas & Sons a bright future for their new arrangements in a useful branch of engineering.

Cheap Literature. — The publication by Messrs. Longmans, Green, & Co., of Lady Brassey's bright, breezy, and popular "Voyage in the Sunbeam" at the price of *sixpence* marks the commencement of an era. It is clearly printed and fully illustrated, and will doubtless penetrate far and wide throughout the kingdom, to be read with pleasure and profit by all classes.

Stamford Priory.—Mr. C. Kains-Jackson writes to say that the threatened desecration of Stamford Priory has been definitely averted, the scheme of turning it into a cart hovel being altogether abandoned.

"The Caravanserai."—Mr. Alsager H. Hill sends us the prospectus of what, as it seems to us, might be made a useful institution. The proposal is to establish in London, in direct connexion with the Central Labour Exchange, "The Caravanserai and Travellers' Rest." The situation selected will be as central as can be secured. At the present time large numbers of workmen, more especially those fresh from the country, find no immediate resort but the common lodging-house, with no facilities for obtaining the necessary information and guidance in their search for work. Apart from the sleeping accommodation, which will be at least equal to the best afforded by the ordinary lodging-house, the "Caravanserai" will, as a special feature, through a reading-room and Labour Exchange attached thereto, supply all the leading facts of the labour market from day to day, and arrangements will be made for employers forwarding to the establishment any special or sudden demand for hands. For the intending emigrant as well as to the stranger settling in London, special information will also be afforded under the auspices of the Central Emigration Agency. The establishment will be on a strictly commercial basis, and only such rules as are necessary to insure discipline and good order will be enforced on the premises. Every facility will be given for employer and employed to meet on the premises. We understand there is something of the kind at Leeds which works well.

Fall of a Church Tower.—The old tower of the church of St. Helen, at the village of West Keal, near Spilsby, Lincolnshire, fell with a crash on Sunday, the 18th ult. Shortly before eleven o'clock, the rector, the Rev. J. S. Ladds, while in the edifice, before the commencement of the morning service, was alarmed by some portions of stonework falling, and ominous sounds proceeding from the tower. Quitting the edifice, others were warned of the approaching danger, and not long afrer the tower showed widened clefts or breaches in its walls, visibly shook, tottered, and fell *en masse*, but, fortunately, without hurt to any one. Nearly the whole of the tower fell to the south in the churchyard, clear of the edifice, with some portions bulging off north and west. The tower was built principally of sandstone, and was one of the most ancient in the neighbourhood. Latterly, from its patched appearance, with brickwork, &c., from repeated repairs, it has presented a very unstable appearance, and ugly fissures were apparent in its walls. The *Lincolnshire Chronicle* says that the heap of ruins show the tower to have fallen from thorough natural decay. The church itself was new roofed in 1853, re-seated in 1865, and the chancel rebuilt in 1867, together with its quaint stone-roofed porch, which is still standing.

A Monster Crane.—One of the largest cranes of its kind has just been manufactured for Mr. J. Dickinson, Sunderland, intended for the Quayside. Messrs. F. & J. Butterfield, Keighley, are the manufacturers of the crane, which will cost, including fixing, about 30,000*l*. It is constructed of wrought iron, mounted on four carriages, each having four runners 3 ft. in diameter. A cast-iron wheel rack is fixed in the centre of the foundation, 25 ft. in diameter, a circular-rack 6¼ pitch being fixed upon it for moving the crane. The length of the jib is 71 ft., and it has a lift of 90 ft., with a staging on the top for a man to stand on. The chain is passed over wrought-iron capped drums, 14¾ in. diameter, milled out to suit the chain, which is 1⅝ in. diameter, five teeth to fit into the links of the chain being fixed on the drum. The crane is geared for twelve, twenty-five, and fifty tons respectively.

Circumlocution in India.—The *Bombay Gazette* says that if a chimney smokes in a barrack at Rangoon the difficulty is encountered as follows:—The officer commanding the troops who occupy the building refers the matter to the proper staff officer, whoever he may be; he communicates with the military staff at Madras; and the commander-in-chief of that Presidency brings the question to the notice of the local Government. The Government of Madras then addresses the Government of India at Simla, and the papers on the subject travel about that pleasant station for a while in boxes. There a despatch is prepared, and finally sent to the Chief Commissioner of British Burmah, who sets the machinery of his administration in motion, and then the officer in charge of military works at Rangoon sends for a mistree, and the chimney is set to rights.

University College, Bristol.—The calendar for the sixth session of University College, Bristol, has just been received. It shows a course of lectures extending over all, or nearly all, the chief branches of a liberal and scientific education. Special attention has been paid to the chemical and engineering departments. Each of them in its own way combines theoretical with practical instruction. In the former, laboratory work, both in the day and evening, supplements the instruction given by general and technical lectures. And in connexion with the latter, arrangements are made by which students attend lectures at the College during the six winter months of the year, and gain their practical experience during the summer months, when they work as articled pupils in the offices and workshops of leading engineering firms of the neighbourhood. The instruction in experimental physics is kept abreast of the rapidly-increasing requirements of the age; and in this subject, as well as in geology, special provision is made for the wants of the engineering students. The growth of Bristol in moral, mental, and material wealth must be much promoted by an institution which gives, as this does, instruction to over 500 men and women. It is to be regretted that the College has no foundation.

Proposed Theatre for Yokohama.—An endeavour is being made to provide Yokohama with a new theatre and public hall. It is proposed, according to the *Japan Weekly Mail*, to start a Public Hall Company, with a capital of $20,000, in 400 shares of $50 each. An active Provisional Committee (composed of Messrs. Ahrens, Bridgford, Emory, Enslie, Fitz-Henry, Fobes, Griffin, Herbert, Rice, and Townley) has been for some time at work over the preliminaries, and it is believed that their efforts to float the scheme will be crowned with success. The Choral and Dramatic Societies have subscribed the sum of $1,000. It is calculated that a building capable of holding 500 persons can be erected in brick and iron, with all internal fittings and furniture complete, for $15,000. Including the purchase of a suitable plot of ground, the sum of $20,000 will be ample for all purposes.

Art at Cardiff.—The fine-art and industrial exhibition at Cardiff, which has been open for the past two months, and has been visited by some 120,000 persons, was brought to a close on Wednesday last. By this exhibition about 3,000*l*. has been raised towards the furnishing and decoration of the local museum and science and art schools and the formation of an art gallery in the town. Sir E. J. Reed, who attended a dinner given to the executive committee of the exhibition a few days ago, then and there presented, as a contribution to the art gallery, Vicat Cole's landscape entitled "Noon," which, while on loan in the exhibition just closed, has been greatly admired by the visitors. The Mayor, in acknowledging this handsome gift, said that its value was 1,000 guineas. It was exhibited at the Royal Academy in 1873.

Congregational Chapel Building.—The builders in the metropolis, according to our contemporary, the *City Press*, have a bright prospect before them so far as regards the erection of places of public worship, seeing that the Congregationalists estimate that they must build eighteen chapels yearly, each capable of holding 1,000 people, even to maintain their present position proportionately to the population. Most other denominations have doubtless to face the same problem, and as some of them have in addition leeway to make up, the erection of new ecclesiastical edifices in London promises to continue.

The Building Trades in Melbourne.—The Melbourne correspondent of the *Times*, writing on August 15th, says,—"A very large number of houses are now in course of erection in Melbourne and the suburbs, and no artisan connected with the building trades need be out of employ if able and willing to work. The demand for bricks so exceeds the supply that orders remain unexecuted for weeks."

Brighton Sanitary Exhibition.—The executive committee have decided to hold a health congress in connexion with the projected sanitary and scientific exhibition at Brighton in December next. The Pavilion committee resolved on Monday to recommend the Town Council to grant the promoters the free use of the whole of the Pavilion buildings.

A Fine-Art Exhibition at Leicester has been opened this week. The pictures number 256.

Open Areas in the Rear of Dwelling-houses in the Metropolis.—At the last meeting of the Lambeth Vestry, Mr. Symons inquired whether it was intended by the Metropolitan Board of Works to obtain an alteration in the Building Act, so as to prevent the backs of houses being built so close together. He also wished to know whether Mr. Fowler, a representative of the Vestry at the Board, would direct the attention of the board to the alleged failure of justice in the case of houses being commenced before action could be taken to prevent their erection. In reply, Mr. Fowler said the Building Act Committee of the Metropolitan Board had before them a book in which anything which appeared to require emendation in the Act was entered. These alterations would no doubt be included—certainly the important question of increasing the area at the backs of houses.

Ecclesiastical Art Exhibition, Newcastle-on-Tyne.—Concurrently with the Church Congress at Newcastle-on-Tyne there will be opened on Monday, the 3rd of October, an Exhibition of Ecclesiastical Art, under the same management as in previous years. The Exhibition will be held at the Auction Rooms, Pilgrim-street. Most of the leading church furnishers are exhibitors, and there is, in addition, a loan collection. Perhaps no one single subject is so thoroughly illustrated as that embraced by Mr. Bragge's collection of 124 Russo-Greek "Icons," or religious pictures, which are so frequently met with in Russia.

The New Corn Exchange Buildings in Sheffield, which cover an area of about 1,500 square yards, and which are now on the eve of completion, were inspected on the 26th ult. by the proprietor, the Duke of Norfolk, lord of the manor. Messrs. Hadfield & Son are the architects. We shall illustrate the new buildings fully before long.

Election of Borough Engineer for Leeds.—A special meeting of the Leeds town council was held on the 22nd ult. for the purpose of appointing a borough engineer, at a salary of 600*l*. a year. There were eighty applications for the post, which has been conferred upon Mr. Thomas Hewson, borough surveyor of Rochdale.

Adelaide Exhibition.—We hear with pleasure that "the gold medal of the Adelaide Exhibition has been awarded to Mr. George Jennings,"—we conclude, for his various important improvements in sanitary appliances and his inventions.

Charing-cross Hospital.—The new school buildings here are to be the scene of a *conversazione* on Monday, the 3rd. Invitations have been sent out by the medical officers and lecturers.

TENDERS

For the erection of additional schools, &c., for the accommodation of about 500 children, in the Banstead-road, Sutton, Surrey, for the Managers of the South Metropolitan School District. Mr. William Wallen, architect. Quantities by Messrs. Franklin & Andrews:—

W. D. Macgregor, London	£108,615 0 0
Jno. Tyerman, London	95,269 0 0
Albert Kimberley, Banbury	94,276 0 0
D. C. Jones & Co., Gloucester	92,847 0 0
Wm. Shepherd, London	91,650 0 0
Fred. Higgs, London	90,750 0 0
Wm. Shurmur, London	86,904 0 0
Jno. Mowlem & Co., London	85,857 0 0
Higgs & Hill, London	85,684 0 0
T. Rider & Son, London	84,888 0 0
Wm. Tongue, London	84,255 0 0
Perry & Co., London	83,989 0 0
Jno. T. Chappell, London	81,800 0 0
C. E. Nightingale, London	83,383 0 0
Jas. Longley, Worth, Sussex	82,846 0 0
W. J. Adcock, Dover	82,764 0 0
W. Crockett, Epsom	81,685 0 0
Jno. Marsland, London	81,473 0 0
T. Boyce, London	81,449 0 0
Paramor & Son, Margate	82,350 0 0
Geo. Shaw, London	81,510 0 0
Martin, Wells, & Co., Aldershot	80,700 0 0
W. J. Beale, London	80,664 0 0
H. F. Hart, London	79,739 0 0
Kirk & Randall, London	78,872 0 0

For new warehouse, Lower Thames-street. Mr. E. N. Clifton, architect:—

Macey	£25,324 0 0
Cooke & Co.	24,982 0 0
Morter	23,343 0 0
Lawrence	22,855 0 0
Ashby & Horner	21,530 0 0
Conder	22,499 0 0
Holland & Hannen	22,284 0 0
Peto, Bros.	22,151 0 0
Brass	21,987 0 0

For the ornamentation of the Royal Avenue Theatre in carton-Pierre, and the decorations of the interior, for Mr. Sefton Parry. Messrs. Fowler & Hill, architects:—
J. M, Bookbinder (accepted).

For the erection of a block of school buildings and appurtenances on a site at Salway-place, Stratford, Essex, for the West Ham School Board. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

W. Gregar	£7,734	0	0
B. E. Nightingale (too late)	7,373	0	0
R. Abrahams	7,195	0	0
T. Boyce	7,180	0	0
North, Bros.	7,150	0	0
Wall, Bros.	6,976	0	0
A. Reed	6,965	0	0
G. Hoskings	6,883	0	0
F. & F. G. Wood	6,795	0	0
J. Morter	6,747	0	0
Hearle & Son	6,683	0	0

Accommodation, 904 children. Cost per child, 7l. 10s.

For alterations, &c. to the Raglan Hotel and Tavern, No. 61, St. Martin's-le-Grand, for Mr. T. Young, Mr. Edward Power, architect:—

Pitcher & Son	£592	0	0
R. Conder	539	0	0
G. Shaw	460	0	0
Hayward & Son	447	0	0
Spencer & Co. (accepted)	415	0	0

For new mortuary, &c., Church-street, Stoke Newington. Mr. J. Douglass Mathews, architect. Quantities supplied:—

Goodall	£664	0	0
Boyce	649	0	0
Ashby, Bros.	559	0	0
Faulkner	557	0	0
Grover	498	0	0
Roberts	492	0	0
Shurmur	477	0	0
Harper	473	0	0
Sharp & Mills	450	0	0

For mission-hall, The Grove, Crouch End. Mr. J. Farrer, architect. Quantities supplied:—

Southcott & Co.	£849	0	0
R. Conder	769	0	0
Harper	743	0	0
Macfarlane	731	0	0
Richards & Jenkinson	695	18	6
J. S. King (accepted)	645	0	0

For drying-factory at Stratford, for Messrs. Jeune & Co. Mr. A. Bradley Rooke, architect. Quantities supplied:—

Harper	£3,573	0	0
Smith	2,580	0	0
Salt	2,428	0	0
Mattock, Bros.	2,379	0	0
Tongue	2,270	0	0
Jones & Co.	2,187	0	0

For making Epirus and Tournay roads, Walham-green, including sewers, for the Middlesex Land Company. Mr. George Edwards, surveyor:—

Pizzey	£3,200	0	0!
Mowlem & Co.	2,200	0	0
Keeble	1,824	0	0
Nowell & Robson	1,550	0	0
Neave & Son	1,547	0	0
Carter	1,539	0	0
Mears	1,520	0	0
Killingback	1,520	0	0
Martin, Wells, & Co.	1,500	0	0
Long	1,281	10	6
Green (accepted)	1,256	0	0!

For the erection of a pair of semi-detached residences, on the Eaton-road, Coventry, for Messrs. Beamish & London. Mr. William Tomlinson, architect:—

G. J. & J. Fox, Atherstone	£3,593	0	0
J. Worwood, Coventry	3,280	0	0
H. Price, Coventry	3,222	0	0
Hallam & Co., Coventry	2,950	0	0
Smith & Son, Kenilworth	2 840	0	0
Chas. Haywood, jun., Coventry *	2,575	0	0
Jos. Makepeace, Coventry	2,550	0	0

* Accepted for slightly revised scheme.

For veterinary stabling, &c., Nottingham, for Mr. J. P. Ford. Messrs. S. Dutton Walker & Howitt, architects:—

Messam	£481	0	0
Jelley	479	0	0
Bell & Son	466	0	0
Clarke	461	0	0
Vickers	447	0	0
Lynam	434	0	0
Scott, Nottingham (accepted)	417	0	0

For rebuilding the Old Red Lion, Hammersmith Mall. Mr. W. Nunn, architect:—

Hunt	£1,180	0	0
Lamble	1,165	0	0
Eyles	1,159	0	0
Wescombe	1,142	0	0
Mansell	1,130	0	0
Chamberlain	1,119	0	0
Nye	1,045	0	0

For Halsey Villas, Woodford. Mr. E. Egan, architect:—

Masters	£1,507	0	0
Egan	1,488	0	0
Wells	1,457	0	0
North, Bros.	1,450	0	0
Reed	1,440	0	0
Wood	1,425	0	0

For pair of villa residences, Hillside, St. Albans, for Mr. Wells. Messrs. J. & F. Clarkson, architects:—

J. S. King, Hornsey	£2,350	0	0
Staines & Sons	2,284	0	0
Savage	1,993	0	0
White, Dunstable	1,990	0	0
Capper	1,600	0	0
Ede & Son, St. Neot's	1,581	0	0
Shoal & Co.	1,555	0	0

For the erection of a detached residence on the Whitgift Estate, Addiscombe. Mr. Daniel R. Dale, architect:—

Marriage, Croydon	£2,820	0	0
Hoare & Son, Blackfriars-road *	2,631	0	0

* Accepted subject to certain alterations.

For a pair of semi-detached villas, at Potters' Bar, for Mr. Ernest Tabernacle. Mr. Burton C. Ravenscroft, architect:—

Eldridge & Gee (accepted).

For internal decorations and repairs at Lonsdale House, Poynder's-road, Clapham Park, for Mr. Thomas Fall:—

T. Potterton (accepted).

For the erection of a pair of model cottages on the Essex Estate, Pentlow, Essex, for the Society for the Propagation of the Gospel:—

Geo. Grimwood & Sons, Sudbury (accepted).

TO CORRESPONDENTS.

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